

OFFICE OF APPLIED STUDIES

Drug Abuse Warning Network, 2005: National Estimates of Drug-Related Emergency Department Visits

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Substance Abuse and Mental Health Services Administration
<http://DAWNinfo.samhsa.gov/>

ACKNOWLEDGMENTS

This publication was prepared by the Substance Abuse and Mental Health Services Administration (SAMHSA), Office of Applied Studies (OAS) with RTI International under Contract No. 280-03-2602. Judy K. Ball, Ph.D., M.P.A. (DAWN Project Director, SAMHSA/OAS), Eric Johnson, Ph.D. (RTI), and Elizabeth Foley, B.A. (RTI), wrote the publication. Other significant contributors included Victoria Albright, M.A. (Project Director, RTI), Karol Krotki, Ph.D. (RTI), Francine Cannarozzi, M.Ed. (RTI), and Elizabeth Crane, Ph.D., M.P.H. (SAMHSA/OAS). The DAWN data collection was conducted by Westat under Contract No. 283-02-9025 under the direction of Josefina Moran, M.A.

PUBLIC DOMAIN NOTICE

All material appearing in this publication is in the public domain and may be reproduced or copied without permission from the Substance Abuse and Mental Health Services Administration (SAMHSA). However, this publication may not be reproduced or distributed for a fee without the specific, written authorization of the Office of Communications, SAMHSA. Citation of the source is appreciated. Suggested citation:

Substance Abuse and Mental Health Services Administration, Office of Applied Studies. *Drug Abuse Warning Network, 2005: National Estimates of Drug-Related Emergency Department Visits*. DAWN Series D-29, DHHS Publication No. (SMA) 07-4256, Rockville, MD, 2007.

OBTAINING ADDITIONAL COPIES OF PUBLICATION

Copies may be obtained, free of charge, from the National Clearinghouse for Alcohol and Drug Information (NCADI). The NCADI is a service of the Substance Abuse and Mental Health Services Administration (SAMHSA). Write or call NCADI at:

National Clearinghouse for Alcohol and Drug Information (NCADI)
P.O. Box 2345, Rockville, MD 20847-2345
1-877-SAMHSA-7 (1-877-726-4727) • 1-800-729-6686 • TDD: 1-800-487-4889

ELECTRONIC ACCESS TO PUBLICATION

This publication can be accessed electronically through Internet World Wide Web connections:

<http://DAWNinfo.samhsa.gov/>
<http://www.samhsa.gov/>
<http://www.oas.samhsa.gov/>

ORIGINATING OFFICE

Substance Abuse and Mental Health Services Administration
Office of Applied Studies
1 Choke Cherry Road, Room 7-1044, Rockville, MD 20857
February 2007

CONTENTS

	Page
Acknowledgments	2
Highlights	7
ED visits involving drug misuse/abuse	7
Illicit drugs in ED visits	8
Alcohol and drug-related ED visits	8
Alcohol in combination with other drugs	8
Alcohol in patients under age 21	9
Nonmedical use of pharmaceuticals	9
Drug misuse and abuse: 2004 and 2005	10
Special types of drug-related ED visits	10
Suicide attempts	10
Seeking detox	11
Introduction	13
Major features of DAWN	13
What is a DAWN case?	13
What drugs are included in DAWN?	13
What is covered in this publication?	14
Estimates in this publication	14
Hospital participation in 2005	15
The margin of error	15
The margin of error and differences across time	16
Estimates adjusted for population size	16
Drug misuse and abuse in ED visits	17
Illicit drugs in ED visits	19
Alcohol in ED visits	27
Alcohol in combination with other drugs (Tables 5-6, Figure 3)	27
Alcohol-related ED visits in patients under the age of 21 (Table 7)	30
ED visits for underage alcohol use (Tables 4, 8, Figure 4)	30
Nonmedical use of pharmaceuticals	33
Nonmedical use of pharmaceuticals (Tables 9-10, Figure 5)	33

CONTENTS

	Page
Comparisons of ED visits in 2004 and 2005	39
Drug misuse and abuse in ED visits (Table 11)	39
Illicit drugs in ED visits (Table 12)	40
Alcohol in ED visits (Tables 13-14)	41
Nonmedical use of pharmaceuticals (Table 15)	42
 Special types of drug-related ED visits	 45
Suicide attempts (Tables 16-17, Figure 6)	45
Suicide attempt ED visits: 2004 and 2005 (Table 18)	50
Seeking detox (Tables 19-20, Figure 7)	53
Seeking detox ED visits: 2004 and 2005 (Table 21)	57
 List of Tables	
Table 1. Drug misuse and abuse in ED visits in the U.S., by type of drug involvement: 2005	18
Table 2. Illicit drugs in ED visits: 2005	20
Table 3. Illicit drugs, by patient characteristics: 2005	23
Table 4. Alcohol in drug-related ED visits: 2005	27
Table 5. Alcohol in combination, by patient and visit characteristics: 2005	28
Table 6. Drugs most frequently reported with alcohol: 2005	29
Table 7. Alcohol in drug-related ED visits in patients under age 21: 2005	30
Table 8. Alcohol only (age < 21), by patient and visit characteristics: 2005	31
Table 9. Nonmedical use of pharmaceuticals: 2005	34
Table 10. Nonmedical use of pharmaceuticals, by patient and visit characteristics: 2005	38
Table 11. Drug misuse and abuse in ED visits in the U.S., by type of drug involvement: 2004 and 2005	39
Table 12. Illicit drugs in ED visits: 2004 and 2005	40
Table 13. Alcohol in drug-related ED visits: 2004 and 2005	41
Table 14. Alcohol in drug-related ED visits in patients under age 21: 2004 and 2005	41
Table 15. Nonmedical use of pharmaceuticals ED visits: 2004 and 2005	42
Table 16. Suicide attempts: 2005	46
Table 17. Suicide attempts, by patient and visit characteristics: 2005	49
Table 18. Suicide attempts: 2004 and 2005	50
Table 19. Seeking detox: 2005	54
Table 20. Seeking detox, by patient and visit characteristics: 2005	55
Table 21. Seeking detox: 2004 and 2005	57

CONTENTS

	Page
List of Figures	
Figure 1. Rates of ED visits involving selected illicit drugs: 2005	22
Figure 2. Illicit drugs, ED visit rates by age and gender: 2005	25
Figure 3. Alcohol with other drugs, ED visit rates by age and gender: 2005	29
Figure 4. Alcohol only (age < 21), ED visit rates by age and gender: 2005	32
Figure 5. Nonmedical use of pharmaceuticals, ED visit rates by age and gender: 2005 ..	37
Figure 6. Suicide attempts, ED visit rates by age and gender: 2005	50
Figure 7. Seeking detox, ED visit rates by age and gender: 2005	56
List of Appendices	
Appendix A: Multum Lexicon End-User License Agreement.	61
Appendix B: Glossary of Terms.	65
Appendix C: DAWN Data Collection and Analytic Methods.	73
Appendix D: DAWN Sampling and Estimation Methodology.	81
Appendix E: Population Data	91
Appendix F: Race and Ethnicity in DAWN	93

HIGHLIGHTS

This publication presents national estimates of drug-related visits to hospital emergency departments (EDs) for 2005, based on data from the Drug Abuse Warning Network (DAWN). DAWN is a public health surveillance system that monitors drug-related ED visits for the Nation and for selected metropolitan areas. DAWN estimates pertain to the entire United States, including Alaska, Hawaii, and the District of Columbia. The Substance Abuse and Mental Health Services Administration (SAMHSA) is the agency responsible for DAWN. SAMHSA is required to collect data on drug-related ED visits under section 505 of the Public Health Service Act.

DAWN relies on a national sample of general, non-Federal hospitals operating 24-hour EDs. The sample is national in scope, with oversampling of hospitals in selected metropolitan areas. Estimates for 2005 are based on data submitted by 355 hospitals. In each participating hospital, ED medical records are reviewed retrospectively to find the ED visits that were related to recent drug use. All types of drugs—illegal drugs, prescription and over-the-counter (OTC) pharmaceuticals, dietary supplements, and nonpharmaceutical inhalants—are included. Alcohol, when it is the only drug implicated in a visit, is included for patients younger than age 21; alcohol, when it is present in combination with another drug, is included for patients of all ages.

The 2005 estimates from DAWN provide the first opportunity since the redesign of DAWN to examine changes over time in drug-related ED visits. Thus, this publication also presents comparisons of estimates from 2004 and 2005. However, with only two years' estimates to compare, we urge caution in interpreting these as trends. No comparisons with prior years are possible, because of the redesign.

ED visits involving drug misuse/abuse

In 2005, hospitals in the United States delivered a total of 108 million ED visits, and DAWN estimates that 1,449,154 (CI: 1,206,622 to 1,691,880)¹ ED visits were associated with drug misuse or abuse. Of those ED visits:

- 31% involved illicit drugs only,
- 27% involved pharmaceuticals only,
- 7% involved alcohol only in patients under the age of 21,
- 14% involved illicit drugs with alcohol,
- 10% involved alcohol with pharmaceuticals,
- 8% involved illicit drugs with pharmaceuticals, and
- 4% involved illicit drugs with pharmaceuticals and alcohol.

¹ The 95% confidence interval (CI) accounts for the margin of error of the estimate. It indicates, with a high degree of confidence, that the true population value was between 1,206,622 and 1,691,880 drug-related ED visits.

Illicit drugs in ED visits

For 2005, DAWN estimates that 816,696 (CI: 666,947 to 966,446) ED visits involved an illicit drug. Thus, over half (56%) of all the drug misuse/abuse ED visits during the year involved an illicit drug either alone or in combination with another drug type. DAWN estimates that:

- Cocaine was involved in 448,481 ED visits (CI: 327,639 to 569,322),
- Marijuana was involved in 242,200 ED visits (CI: 203,395 to 281,006),
- Heroin was involved in 164,572 ED visits (CI: 123,613 to 205,531),
- Stimulants, including amphetamines and methamphetamine, were involved in 138,950 ED visits (CI: 86,163 to 191,737), and
- Other illicit drugs, such as PCP, Ecstasy, and GHB, were much less frequent than any of the above.

Taking the margin of error into account, the stimulants (amphetamines and methamphetamine) may be as frequent as heroin in drug-related ED visits, but the stimulants are less frequent than cocaine or marijuana.

After taking population size and the margin of error into account:

- The rates of ED visits involving cocaine, marijuana, and heroin were higher for males than females, but the rates for stimulants did not differ by gender,
- For cocaine, the rates for patients aged 18 to 54 were similar,² with lower rates for younger and older patients,
- For heroin, the rates were highest for patients aged 21 to 44,
- For marijuana, the rates were highest for patients aged 18 to 24, and
- For stimulants, the rates were highest for patients aged 18 to 44.

Alcohol and drug-related ED visits

For 2005, DAWN estimates that 492,655 (CI: 424,660 to 560,649) ED visits involved either alcohol in combination with another drug (all ages) or alcohol alone for patients under the age of 21. This is about one third (34%) of all drug misuse/abuse ED visits. Since DAWN does not account for ED visits involving alcohol alone in adults, the actual number of ED visits involving alcohol is higher. Alcohol is reported to DAWN when it is present in combination with other drugs, regardless of the patient's age.

Alcohol in combination with other drugs

In 2005, DAWN estimates 394,224 (CI: 331,964 to 456,485) ED visits related to use of alcohol in combination with other drugs. Alcohol was most frequently combined with:

- Cocaine alone (86,482 visits),
- Marijuana alone (33,643 visits),
- Cocaine and marijuana (22,377 visits), and
- Heroin alone (12,797 visits).

² That is, the rates for the age categories 18 to 20, 21 to 24, 25 to 29, 30 to 34, 35 to 44, and 45 to 54 were not significantly different.

Alcohol in patients under age 21

DAWN estimates 56,978 (CI: 45,810 to 68,146) alcohol-related ED visits for patients aged 12 to 17, and 88,781 (CI: 73,468 to 104,094) alcohol-related ED visits for patients aged 18 to 20. Alcohol is an illegal drug for both of these age groups.

About two thirds of the alcohol-related ED visits for minors involved alcohol and no other drug. DAWN estimates 98,430 (CI: 80,258 to 116,602) ED visits involved alcohol as the only drug.

Taking population size and the margin of error into account:

- The rate of alcohol-only ED visits for patients aged 18 to 20 (487 visits per 100,000 population) was 3.5 times that for patients aged 12 to 17 (141 per 100,000), and
- Males and females had similar rates.

Nonmedical use of pharmaceuticals

For 2005, DAWN estimates that 598,542 (CI: 486,771 to 710,314) ED visits involved nonmedical use of prescription or OTC pharmaceuticals or dietary supplements. The majority of these visits (55%) involved multiple drugs.

Central nervous system (CNS) agents (51% of nonmedical-use visits) and psychotherapeutic agents (46%) were the most frequent drugs reported in the nonmedical-use category of ED visits.

Among the CNS agents, the most frequent drugs were opiate/opioid analgesics (33% of nonmedical-use visits), including single-ingredient (e.g., oxycodone) and combination forms (e.g., hydrocodone with acetaminophen). Methadone, together with single-ingredient and combination forms of oxycodone and hydrocodone, were the most frequent opioids. Once the margin of error is taken into account, these three opioids appeared in similar numbers of visits:

- Hydrocodone/combinations in 51,225 ED visits (CI: 37,416 to 65,033),
- Oxycodone/combinations in 42,810 ED visits (CI: 30,672 to 54,948), and
- Methadone in 41,216 ED visits (CI: 29,249 to 53,184).

It is not possible to know, based on the documentation available in ED medical records, the extent to which the source of these drugs is a legitimate prescription, as opposed to other sources, nor is it possible to distinguish methadone used for treatment of opiate addiction from the methadone in pill form, which is prescribed for pain. In fact, methadone may be one of the most ambiguous drugs to categorize in DAWN. When a patient on opioid replacement therapy presents to an ED, methadone may be routinely documented in the medical record, but without sufficient detail to distinguish whether the methadone specifically was related to the ED visit.

Among the psychotherapeutic agents, the anxiolytics (anti-anxiety agents), sedatives, and hypnotics were the most frequent, occurring in a third (34%) of visits associated with nonmedical use of pharmaceuticals. ED visits involving benzodiazepines clearly outnumber those involving any of the other types of psychotherapeutic agents. DAWN estimates that 172,388 (CI: 135,948 to 208,828) ED visits associated with nonmedical use of

pharmaceuticals involved benzodiazepines in 2005. This is comparable to the number for prescription opiates/opioids.

Taking population size and the margin of error into account:

- ED visit rates for nonmedical use of pharmaceuticals did not differ between females and males, and
- ED visit rates were highest for patients aged 18 to 54.

Drug misuse and abuse: 2004 and 2005

In 2005, hospitals in the United States delivered a total of 108 million ED visits, an increase of 2.3% over 2004. The population of the United States increased 0.9%, from 294 million to 296 million, over the same period.

According to DAWN, the total number of ED visits attributable to drug misuse and abuse was stable from 2004 to 2005. That is, the difference is not statistically significant. Likewise, no changes in ED visits from 2004 to 2005 were detected for any of the major illicit drugs or for alcohol.

ED visits related to nonmedical use of pharmaceuticals increased 21% from 2004 to 2005. Among the pharmaceuticals more frequently implicated in nonmedical use, the following changes are noted:

- Benzodiazepines increased 19%,
- Opiates/opioids increased 24% overall, with unspecified opiates increasing 33%, and
- Methadone increased 29%.

We cannot assess whether these changes may be related to changes in the quantity of these pharmaceuticals being prescribed for therapeutic uses. A decrease was observed in nonmedical-use visits involving Cox-2 inhibitors (e.g., Vioxx®, Bextra®, and Celebrex®). This may be associated with the decrease in medical use of Cox-2 inhibitors during the same period.

Special types of drug-related ED visits

Suicide attempts

DAWN estimates 132,582 (CI: 113,283 to 151,882) ED visits for drug-related suicide attempts in 2005.³ Nearly two thirds (63%) of ED visits for drug-related suicide attempts involved multiple drugs.

In these ED visits for drug-related suicide attempts in 2005:

- One third (33%) involved alcohol, but DAWN data exclude visits for adults when alcohol is the only drug,
- About one fifth (19%) involved an illicit drug,
- The majority of drug-related suicide attempts (93%) involved pharmaceuticals,
- More than half (56%) included psychotherapeutic agents, such as benzodiazepines or antidepressants, and
- Slightly less than half (45%) involved CNS agents, primarily analgesics (pain relievers), including both prescription and OTC formulations.

³ Though a drug was implicated in each visit, these attempts are not limited to drug overdoses.

Overall there was no significant change in ED visits for drug-related suicide attempts from 2004 to 2005. Nor were significant changes found for any of the drugs frequently involved in these suicide attempts.

Seeking detox

DAWN estimates 174,141 (CI: 59,348 to 288,933) drug-related ED visits for patients seeking detoxification or substance abuse treatment services during 2005. However, these visits tend to be concentrated in hospitals with administrative policies that require medical clearance in the ED for admission to these specialized units within the hospital. Therefore, these visits do not encompass the full extent of the demand for these services.

Nearly two thirds (64%) of the seeking detox ED visits involved multiple drugs. Illicit drugs and alcohol were common in these visits:

- Cocaine (45% of visits) and heroin (26%) were followed in frequency by marijuana (14%) and amphetamine or methamphetamine stimulants (10%), and
- Alcohol in combination with another drug was implicated in about a third (36%) of seeking detox ED visits.

Among the seeking detox ED visits, nearly 8 out of 10 (78%) received some type of follow-up care, either inpatient admission, referral elsewhere for detox or substance abuse treatment services, or transfer to another health care facility. However, almost one fifth (18%) of seeking detox cases might not have received the care they sought, because they were discharged to home.

No changes in ED visits from 2004 to 2005 were detected for seeking detox ED visits overall, or for alcohol or the illicit drugs involved in these visits.

INTRODUCTION

This publication presents final estimates of drug-related emergency department (ED) visits from the Drug Abuse Warning Network (DAWN) for 2005. DAWN is a public health surveillance system that monitors drug-related ED visits for the Nation and for selected metropolitan areas. The Office of Applied Studies (OAS) of the Substance Abuse and Mental Health Services Administration (SAMHSA), U.S. Department of Health and Human Services, has been responsible for DAWN operations since 1992.

Major features of DAWN

What is a DAWN case?

One of the most important features of DAWN is its expansive definition of a case:

A DAWN case is any ED visit related to recent drug use.

To be a DAWN case, the relationship between the ED visit and the drug use need not be causal; the drug needs only to be implicated in the visit. This approach accommodates cases where one or more drugs were involved but may or may not have directly caused the condition generating the ED visit, but at the same time avoids inclusion of current medications that are unrelated. Only recent drug use is included;⁴ the reason a patient used a drug need not be specified; and the criteria are broad enough to encompass all types of drug-related events, including explicit drug abuse. See Appendix C: DAWN Data Collection and Analytic Methods for a full description of DAWN cases and data collected on those cases.

What drugs are included in DAWN?

DAWN collects data on all types of drugs, including:⁵

- Illegal drugs, such as heroin, cocaine, marijuana, and Ecstasy,
- Prescription drugs, such as Prozac®, Vicodin®, OxyContin®, alprazolam, and methylphenidate,
- Over-the-counter (OTC) medications, such as aspirin, acetaminophen, ibuprofen, and multi-ingredient cough and cold remedies,
- Dietary supplements, such as vitamins, herbal remedies, and nutritional products,
- Psychoactive, nonpharmaceutical inhalants,⁶
- Alcohol in combination with other drugs, and
- Alcohol alone, in patients aged less than 21 years.⁷

⁴ That is, patients with a history of drug use (and no recent use) are excluded.

⁵ The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2005, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2006). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

⁶ To be reportable, a nonpharmaceutical substance must be consumed by inhalation, sniffing, or snorting and must have a psychoactive effect when inhaled. An ED visit involving inhalation of a nonpharmaceutical, psychoactive substance qualifies as a DAWN case even if no other drug was present. Carbon monoxide is excluded from the inhalants. Since 2004, cases involving accidental exposures (e.g., exposure to paint fumes while painting a closet) have been excluded as well.

⁷ ED visits related to alcohol use alone are excluded for patients aged 21 and over.

What is covered in this publication?

While the full array of drug-related ED visits covered by DAWN is very broad, this publication focuses primarily on ED visits involving drug misuse and abuse. The national estimates of ED visits associated with drug misuse and abuse are presented in terms of the following three categories:

- Illicit drugs,
- Alcohol, and
- Nonmedical use of pharmaceuticals.

The illicit drugs category covers ED visits involving the use of illegal substances. The alcohol category includes alcohol used in combination with other drugs and alcohol used alone in patients under 21, but excludes alcohol used alone in patients aged 21 and over. Nonmedical use of pharmaceuticals includes ED visits related to the misuse or abuse of prescription or OTC medications or dietary supplements. Nonmedical use includes taking a higher than prescribed or recommended dose of a pharmaceutical (i.e., contrary to directions or labeling), taking a pharmaceutical prescribed for another individual, malicious poisoning of the patient by another individual, and substance abuse involving pharmaceuticals.⁸

In addition, this report includes a separate section on two special types of ED visits: drug-related suicide attempts and patients “seeking detox.” The latter includes patients who present to the ED seeking detoxification services or entry into a substance abuse treatment program. These visits tend to be concentrated in hospitals with administrative practices requiring medical clearance in the ED for admission to detox or substance abuse treatment units within the hospital. Drug-related ED visits involving suicide attempts or seeking detox are excluded from the category of nonmedical use of pharmaceuticals.

Estimates in this publication

Estimates in this publication were calculated by applying sampling weights to data from a probability sample of hospitals and accounting for the survey design. Only national estimates pertaining to the entire United States—50 States and the District of Columbia—are provided in this publication.

Hospitals eligible for the DAWN sample are non-Federal, short-stay, general surgical and medical hospitals in the United States that operate 24-hour EDs. The American Hospital Association’s (AHA) 2001 Annual Survey is the source of the sampling frame. For a definition of sampling frame and other technical terms used in this publication, see Appendix B: Glossary of Terms.

The DAWN sample of hospitals includes an oversampling of hospitals in selected metropolitan areas (referred to as “Metropolitan Statistical Areas” or MSAs), supplemented with a sample of hospitals from the remainder of the United States, which includes other metropolitan areas, as well as nonmetropolitan and rural areas. The metropolitan area boundaries correspond to the definitions issued by the Office of Management and Budget (OMB) in June 2003. National estimates are calculated as the sum of the estimates from 11 geographic areas (10 metropolitan areas, divisions, and subareas plus the sample from the remainder of the United States) after

⁸ Excluded are suicide attempts involving pharmaceuticals, accidental ingestions, visits for patients seeking detoxification services or entry into a substance abuse treatment program, and visits associated with the therapeutic use of pharmaceuticals.

taking into account nonresponse, the volume of ED visits delivered by the universe of eligible hospitals in each area, and data quality factors. A more detailed discussion of the DAWN sample of hospitals and estimation procedures is provided in Appendix D: DAWN Sampling and Estimation Methodology.

Hospital participation in 2005

For 2005, 355 hospitals submitted data that were used for estimation. The overall weighted response rate was 43.2%. For the 10 oversampled metropolitan areas and divisions, the individual response rates ranged from 59.0% in New Orleans to 78.5% in Denver. Additional detail on response rates is provided in Appendix C.

DAWN cases are found through a retrospective review of medical records in participating hospitals. Across the 355 participating hospitals, more than 11.8 million charts were reviewed to find the drug-related ED visits that met the DAWN case criteria. Based on the review of charts, 364,012 drug-related visits were found and submitted. On average, a DAWN member hospital submitted 1,025 DAWN cases. However, the number of submitted cases varied widely across hospitals, from 1 case to 9,012 cases (median 640) in a single hospital during 2005.

The margin of error

Since DAWN relies on a sample of hospitals, each estimate produced from the DAWN ED data is subject to sampling variability, referred to as the “margin of error.” This is the variation in the estimate that would be observed naturally if different samples were drawn from the same population using the same procedures. The sampling variability of an estimate in this publication is measured by its relative standard error (RSE). The precision of an estimate is inversely related to its sampling variability, as measured by the RSE: the greater the RSE, the lower the precision.

DAWN estimates with RSE values greater than 50% and estimates less than 30 are regarded as too imprecise for publication and are not shown. In the tables, three periods (“...”) are shown in the place of estimates that have an RSE greater than 50% or estimates less than 30. Ratios (percentages or rates per 100,000 population) based on suppressed estimates are likewise suppressed. Gray shading in a cell indicates that the cell is not applicable. For example, drugs other than alcohol cannot be present in an “alcohol-only” category.

In this publication, confidence intervals (CIs) are included in many of the tables and are cited in the text along with the estimates. Technically, a 95% CI means that if repeated samples were drawn from the same population of hospitals using the same sampling and data collection procedures, the true population value would fall within the confidence interval 95% of the time. As a practical matter, a CI, which is expressed as a range of values, does a better job of illustrating the true nature of the statistical estimates, because the interval reflects both the estimate and its particular margin of error.

For readers unfamiliar with these statistical concepts, additional descriptions and examples are provided in Appendix D.

The margin of error and differences across time

In this publication, we assess differences between 2004 and 2005 estimates as the estimated percent change. However, the estimated percent change must exceed its margin of error in order to be considered a reliable difference between the estimates for the two years. That is, the difference must be statistically different from no change. We do this because a difference that is not statistically significant may be no difference at all. Therefore, the only differences shown in this publication as percentage changes are those that meet the standard for statistically significant differences. See Appendix D for additional details.

Major changes to DAWN were instituted at the beginning of 2003 as the result of a redesign that altered most of DAWN's core features. Changes included the design of the hospital sample, the drug-related cases eligible for DAWN, and the data items submitted on these cases. These improvements created a permanent disruption in trends. As a result, comparisons cannot be made between old DAWN (2002 and prior years) and the redesigned DAWN (2004 and forward).⁹

Estimates adjusted for population size

Standardized measures are needed to make valid comparisons of ED visits across age and gender categories that differ in population size. For age in particular, the size of the underlying population differs considerably across age groups; for example, the number of individuals aged 18 to 20 in the United States is much lower than the number of individuals aged 35 to 44.

To take the size of the underlying population into account, rates of ED visits per 100,000 people are generated using population data from the U.S. Bureau of the Census.¹⁰ An example of how these rates are generated is provided in Appendix D, and the population estimates used for this publication are found in Appendix E: Population Data.

Standardized rates are not calculated for race and ethnicity subgroups because the race and ethnicity categories available to DAWN are much less detailed and contain considerably more missing data than the race and ethnicity categories in the Census data. Appendix F: Race and Ethnicity in DAWN, describes the race and ethnicity data reported to DAWN.

⁹ For DAWN, 2003 was a transition year: 2003 data reflected some of the new features (e.g., the expanded case criteria) but also some of the old (e.g., the old sample of hospitals). Full-year estimates were not published for 2003, and the estimates that were published are not comparable to those from prior or subsequent years.

¹⁰ Population estimates for 2005, as of July 2006, from U.S. Census Bureau County Population Dataset NC-EST2005-ALLDATA (see <http://www.census.gov/popest/national/asrh/NC-EST2005/NC-EST2005-03.csv>).

DRUG MISUSE AND ABUSE IN ED VISITS

For 2005, DAWN estimates that over 1.4 million ED visits were associated with drug misuse or abuse (Table 1). This estimate includes:

- 816,696 ED visits (CI: 666,947 to 966,446) that involved illicit drugs alone or in combination with other drugs,
- 492,655 ED visits (CI: 424,660 to 560,649) that involved the use of alcohol alone or in combination with other drugs, and
- 598,542 ED visits (CI: 486,771 to 710,314) associated with nonmedical use of pharmaceuticals alone or in combination with other drugs.¹¹

Of the 1.4 million drug misuse/abuse visits, about two thirds (65%) were associated with a single drug type. ED visits involving illicit drugs alone accounted for 31% of all visits related to drug misuse/abuse in 2005. ED visits involving nonmedical use of pharmaceuticals alone accounted for another 27%. In 2005, 7% of drug misuse/abuse visits were related to consumption of alcohol (and no other drug) by a minor.¹² The remaining visits (35%) involved some combination of illicit drugs, alcohol, and/or pharmaceuticals.

This does not suggest that the majority of ED drug misuse/abuse visits involved a single drug. In fact, the typical drug-related ED visit involves multiple drugs, but these may be of a common type. For example, an ED visit involving illicit drugs alone may involve more than one illicit drug (e.g., cocaine and heroin).

ED visits in each of the three major categories—illicit drugs, alcohol, and nonmedical use of pharmaceuticals—are discussed in greater detail in separate sections of this publication.

¹¹ These three categories of ED visits are not mutually exclusive, and the sum of the estimates is greater than the total number of drug misuse/abuse visits. See Appendix C for additional detail on the ED visits included in each category.

¹² ED patients over the age of 21 for whom alcohol was the only drug associated with their ED visits are not considered DAWN cases.

Table 1**Drug misuse and abuse in ED visits in the U.S., by type of drug involvement: 2005**

Drug involvement ¹	Estimated visits ²	Percent of visits	Relative standard error (RSE)	95% Confidence interval		
				Lower bound	-	Upper bound
All types of drug misuse/abuse	1,449,154	100%	8.5	1,206,422	-	1,691,886
Illicit drugs only	450,296	31%	11.9	345,526	-	555,066
Alcohol only (age < 21)	98,364	7%	9.4	80,189	-	116,539
Pharmaceuticals only	395,617	27%	10.1	317,048	-	474,186
Combinations					-	
Illicit drugs with alcohol ³	199,008	14%	7.9	168,009	-	230,007
Illicit drugs with pharmaceuticals	110,652	8%	12.3	83,953	-	137,351
Alcohol with pharmaceuticals	138,477	10%	11.0	108,710	-	168,244
Illicit drugs with alcohol and pharmaceuticals	56,740	4%	11.1	44,427	-	69,053

¹ The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2005, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2006). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

³ DAWN excludes alcohol-only visits for adults. Alcohol, when present with other drugs, is included for all ages.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).

ILLCIT DRUGS IN ED VISITS

To better understand the role of specific drugs and types of drugs in ED visits, this publication provides more detailed analysis of three drug categories: illicit drugs, alcohol, and nonmedical use of pharmaceuticals. This section focuses on ED visits involving illicit drugs.

For 2005, DAWN estimates that 816,696 (CI: 666,947 to 966,446) ED visits involved an illicit drug (Table 2). Thus, over half (56%) of all the drug misuse/abuse ED visits during the year involved an illicit drug, either alone or in combination with another drug type.

DAWN estimates that cocaine was involved in 448,481 (CI: 327,639 to 569,322) ED visits. In other words, close to one in three drug misuse/abuse ED visits (31%) involved cocaine.

Marijuana was involved in 242,200 (CI: 203,395 to 281,006) ED visits. Although it was associated with the second highest number of drug misuse/abuse ED visits for illicit drugs, marijuana was involved in approximately half as many ED visits as cocaine.

Heroin was involved in 164,572 (CI: 123,613 to 205,531) ED visits, or 11% of drug misuse/abuse ED visits overall. This is likely an underestimate, though, because some portion of heroin use has been unavoidably classified as an “unspecified opiate.” Heroin is an opiate, and some drug screens test for opiates only as a class. About two thirds (69%) of reports of “opiates” submitted to DAWN for 2005 came from toxicology findings, so some unknown quantity of these may have been heroin. The number of ED visits involving unspecified opiates is estimated at 24,490 (CI: 18,634 to 30,446) visits.

Stimulants, including amphetamines and methamphetamine, were involved in 138,950 (CI: 86,163 to 191,737) ED visits, about 10% of drug misuse/abuse ED visits. Amphetamines and methamphetamine are combined for this analysis because some drug screens test for amphetamines only as a class. Consequently, an amphetamine-positive result could indicate amphetamine or methamphetamine. Nearly all the reports of amphetamines submitted to DAWN came simply as “amphetamine” and about three quarters (74%) of those were derived from toxicology findings.

Other illicit drugs appeared at much lower frequencies. For 2005, DAWN estimates:

- MDMA (Ecstasy) in 10,752 ED visits (CI: 7,448 to 14,055),
- PCP in 7,535 ED visits (CI: 5,056 to 10,013),
- Miscellaneous hallucinogens in 3,792 ED visits (CI: 2,438 to 5,145),
- LSD in 1,864 ED visits (CI: 1,085 to 2,644),
- GHB in 1,861 ED visits (CI: 670 to 3,052), and
- Ketamine in 275 ED visits (CI: 153 to 397).

Table 2**Illicit drugs in ED visits: 2005**

Drug category and selected drugs ¹	Estimated visits ^{2,3,4}	Relative standard error (RSE)	95% Confidence interval		
			Lower bound	-	Upper bound
Drug-related ED visits					
Total drug misuse/abuse ED visits	1,449,154	8.5	1,206,422	-	1,691,886
ED visits, illicit drugs	816,696	9.4	666,947	-	966,446
Cocaine	448,481	13.7	327,639	-	569,322
Heroin	164,572	12.7	123,613	-	205,531
Marijuana	242,200	8.2	203,395	-	281,006
Stimulants	138,950	19.4	86,163	-	191,737
Amphetamines	35,827	13.3	26,491	-	45,163
Methamphetamine	108,905	23.6	58,469	-	159,340
MDMA (Ecstasy)	10,752	15.7	7,448	-	14,055
GHB	1,861	32.6	670	-	3,052
Flunitrazepam (Rohypnol)	596	45.0	70	-	1,121
Ketamine	275	22.6	153	-	397
LSD	1,864	21.3	1,085	-	2,644
PCP	7,535	16.8	5,056	-	10,013
Miscellaneous hallucinogens	3,792	18.2	2,438	-	5,145
Inhalants	4,312	15.2	3,030	-	5,594
Combinations not tabulated above (NTA)	1,755	21.0	1,033	-	2,477

Table 2 (continued)

Illicit drugs in ED visits: 2005

Drug category and selected drugs ¹	ED visits per 100,000 population ^{2,3,4}	Relative standard error (RSE)	95% Confidence interval		
			Lower bound	-	Upper bound
ED visits per 100,000 population					
Total drug misuse/abuse ED visits	488.9	8.5	407.0	-	570.8
ED visits, illicit drugs	275.5	9.4	224.7	-	326.3
Cocaine	151.3	13.7	110.5	-	192.1
Heroin	55.5	12.7	41.7	-	69.3
Marijuana	81.7	8.2	68.6	-	94.8
Stimulants	46.9	19.4	29.1	-	64.7
Amphetamines	12.1	13.3	8.9	-	15.2
Methamphetamine	36.7	23.6	19.7	-	53.8
MDMA (Ecstasy)	3.6	15.7	2.5	-	4.7
GHB	0.6	32.6	0.2	-	1.0
Flunitrazepam (Rohypnol)	0.2	45.0	0.0	-	0.4
Ketamine	0.1	22.6	0.1	-	0.1
LSD	0.6	21.3	0.4	-	0.9
PCP	2.5	16.8	1.7	-	3.4
Miscellaneous hallucinogens	1.3	18.2	0.8	-	1.7
Inhalants	1.5	15.2	1.0	-	1.9
Combinations NTA	0.6	21.0	0.3	-	0.8

¹ The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2005, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2006). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

³ ED visits often involve multiple drugs. Such visits will appear multiple times in this table (e.g., a visit involving both cocaine and heroin will appear twice in this table). Summing ED visits as reported in this table will produce incorrect and inflated counts of ED visits.

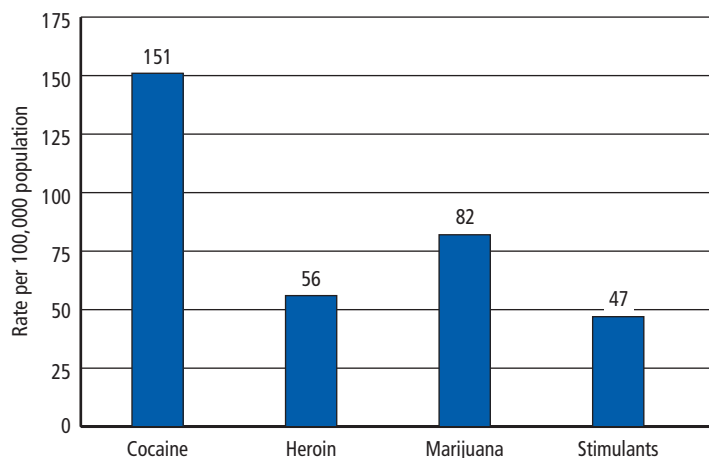
⁴ Three dots (...) indicate that an estimate with an RSE greater than 50% or an estimate less than 30 has been suppressed.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).

When considered in relation to the population of the United States, ED visits associated with illicit drugs vary across major drugs of abuse (Figure 1):

- 151 visits per 100,000 population for cocaine,
- 82 visits per 100,000 population for marijuana,
- 56 visits per 100,000 population for heroin, and
- 47 visits per 100,000 population for stimulants.

Figure 1
Rates of ED visits involving selected illicit drugs: 2005



SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).

The rates of ED visits involving cocaine, marijuana, and heroin were higher for males than for females, after taking population size and the margin of error into account, but there was not a gender difference for stimulants (Figure 2). For cocaine the rates per 100,000 population were highest among patients aged 18 to 54, with lower rates for younger and older patients (Table 3, Figure 2). For heroin, the rates were highest for patients aged 21 to 44, while the rates for marijuana were highest for patients aged 18 to 24, and the rates for stimulants were highest for patients aged 18 to 44.

In terms of race/ethnicity, 46% of the visits related to any illicit drug use involved patients who were white. However, evaluating the relative frequencies across the race/ethnicity groups is impeded by missing data; race/ethnicity was unknown in 13% of illicit drug-related visits overall, and the percentage was higher for some drugs (e.g., 16% for heroin and 17% for MDMA).

Table 3**Illicit drugs, by patient characteristics: 2005**

Patient characteristics	Selected drugs ¹								
	All illicit	Cocaine	Heroin	Marijuana	Stimulants	MDMA (Ecstasy)	GHB	LSD	PCP
Drug-related ED visits ^{2,3}									
ED visits, illicit drugs	816,696	448,481	164,572	242,200	138,950	10,752	1,861	1,864	7,535
Gender									
Male	527,419	292,402	109,031	161,532	84,385	6,330	1,151	1,614	4,620
Female	288,960	155,985	55,503	80,597	54,419	4,419	...	251	2,913
Unknown	318	93	38	71	...	...	...	...	...
Age									
0-5 years	720	212	42	129	287	...	...	...	33
6-11 years	580	...	...	...	...	...	...	...	...
12-17 years	50,457	9,295	992	37,790	7,542	2,068	63	330	684
18-20 years	64,434	23,278	8,734	32,993	13,255	2,098	...	338	593
21-24 years	98,017	41,117	19,926	38,812	20,992	3,355	365	447	1,567
25-29 years	106,053	54,812	22,670	32,801	24,193	1,436	649	221	1,417
30-34 years	98,567	55,964	22,350	25,337	20,043	959	271	174	1,012
35-44 years	231,091	155,690	46,106	45,093	35,055	660	275	297	1,351
45-54 years	137,374	90,558	35,665	23,716	14,563	...	...	43	576
55-64 years	25,490	15,042	7,157	4,744	2,585	...	...	...	276
65 years and older	3,236	1,821	825	403	...	...	...	...	...
Unknown	677	513	91	239	44	...	...	...	...
Race/ethnicity									
White	379,067	169,429	74,778	121,629	95,699	4,896	1,553	1,345	2,591
Black	224,084	166,496	35,671	59,288	7,224	3,235	...	183	2,038
Hispanic	94,291	51,639	25,869	26,543	14,997	655	...	...	1,386
Race/ethnicity not tabulated above (NTA)	9,932	4,644	1,722	2,740	2,951	171	...	...	72
Unknown	109,322	56,274	26,532	32,001	18,079	1,795	151	203	...

Table 3 (continued)**Illicit drugs, by patient characteristics: 2005**

Patient characteristics	Selected drugs ¹								
	All illicit	Cocaine	Heroin	Marijuana	Stimulants	MDMA (Ecstasy)	GHB	LSD	PCP
ED visits per 100,000 population ^{2,3}									
ED visits, illicit drugs	275.5	151.3	55.5	81.7	46.9	3.6	0.6	0.6	2.5
Gender									
Male	361.2	200.3	74.7	110.6	57.8	4.3	0.8	1.1	3.2
Female	192.1	103.7	36.9	53.6	36.2	2.9	...	0.2	1.9
Age									
0-5 years	3.0	0.9	0.2	0.5	1.2	...	...	...	...
6-11 years	2.4	...	...	...	...	...	...	...	...
12-17 years	197.9	36.5	3.9	148.3	29.6	8.1	0.2	1.3	...
18-20 years	517.5	187.0	70.1	265.0	106.5	16.8	...	2.7	4.8
21-24 years	581.5	243.9	118.2	230.2	124.5	19.9	2.2	2.6	9.3
25-29 years	528.5	273.2	113.0	163.5	120.6	7.2	3.2	1.1	7.1
30-34 years	490.9	278.7	111.3	126.2	99.8	4.8	1.4	0.9	5.0
35-44 years	526.9	355.0	105.1	102.8	79.9	1.5	0.6	...	3.1
45-54 years	323.4	213.2	84.0	55.8	34.3	...	...	0.1	1.4
55-64 years	84.0	49.6	23.6	15.6	8.5	...	...	...	0.9
65 years and older	8.8	4.9	2.2	1.1	...	...	...	...	...

¹ The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2005, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2006). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

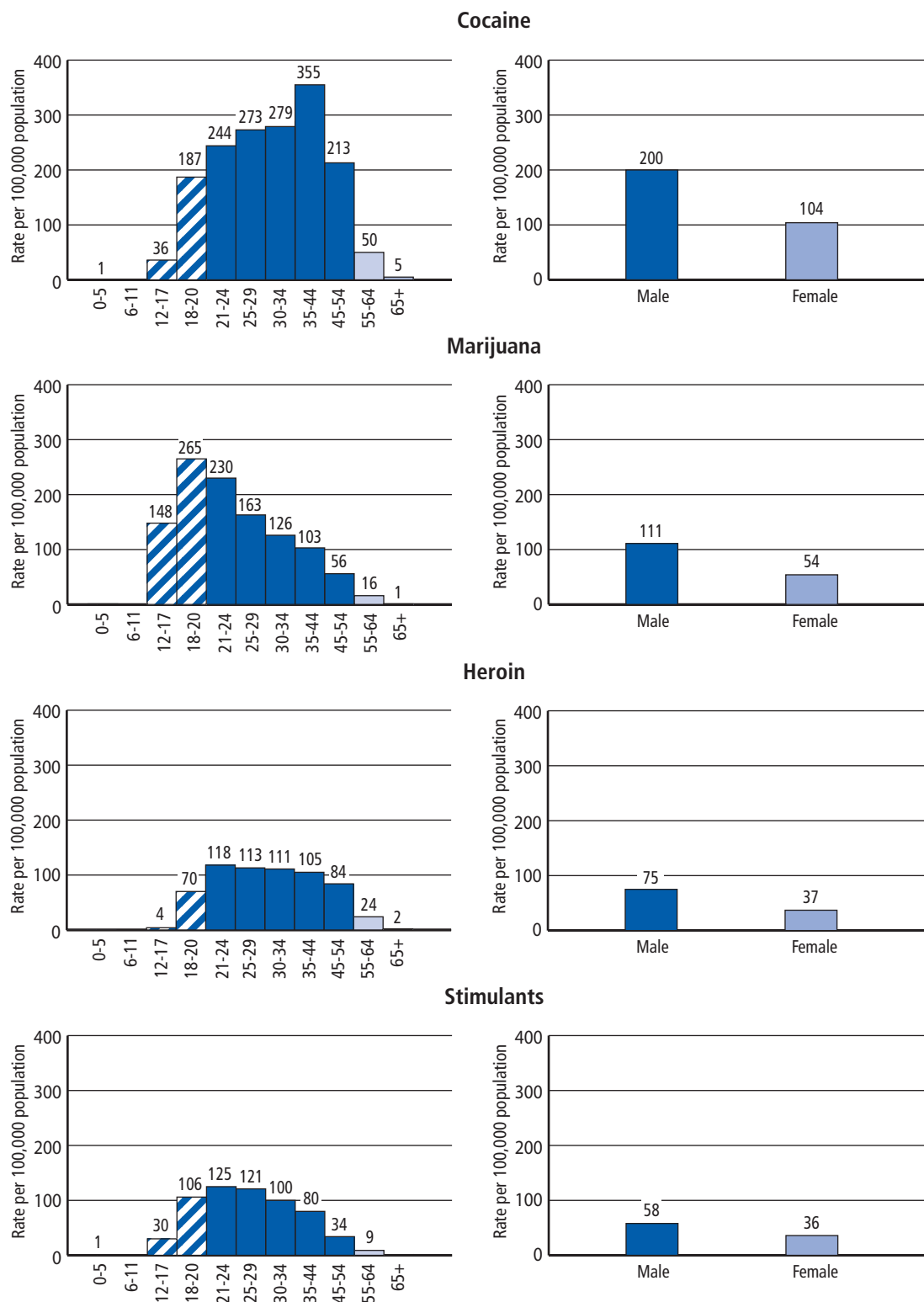
² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

³ Three dots (...) indicate that an estimate with an RSE greater than 50% or an estimate less than 30 has been suppressed.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).

Figure 2

Illicit drugs, ED visit rates by age and gender: 2005



SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).

ALCOHOL IN ED VISITS

Among all the drugs collected by DAWN, alcohol is unique. An ED visit related to alcohol use qualifies as a DAWN case under only two conditions: (1) the alcohol is found in combination with other drugs, regardless of patient age; or (2) the alcohol is found alone (i.e., not in combination with other drugs) in a patient under the age of 21. ED visits associated with alcohol use, particularly among underage patients, represent a significant public health and policy concern and are examined in detail in this chapter.

For 2005, DAWN estimates that 492,655 (CI: 424,660 to 560,649) ED visits involved either alcohol in combination with another drug (all ages), or alcohol alone for patients under the age of 21. This is about one third (34%) of all drug misuse/abuse ED visits (Table 4). Of all these ED visits involving alcohol, about one fifth (20%) involved patients under the age of 21 who used alcohol alone, that is, with no other drug.

Table 4
Alcohol in drug-related ED visits: 2005

Drug category and selected drugs ¹	Estimated visits ^{2,3}	Relative standard error (RSE)	95% Confidence interval		
			Lower bound	-	Upper bound
Total drug misuse/abuse ED visits	1,449,154	8.5	1,206,422	-	1,691,886
ED visits, alcohol	492,655	7.0	424,660	-	560,649
Alcohol in combination	394,224	8.1	331,964	-	456,485
Alcohol alone	98,430	9.4	80,258	-	116,602

¹ The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2005, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2006). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

³ Estimates are all expressed in visits.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).

Alcohol in combination with other drugs (Tables 5-6, Figure 3)

DAWN estimates 394,224 (CI: 331,964 to 456,485) ED visits related to use of alcohol in combination with another drug(s) in 2005. Alcohol in combination with other drugs is reported to DAWN regardless of the patient's age. These are the only alcohol reports received for patients aged 21 and older. It is these adult patients who account for nearly 9 out of 10 ED visits (88%) implicating alcohol with another drug (Table 5).

Males accounted for 62% of visits involving alcohol in combination with other drugs (Table 5). Taking population size into account, males had higher rates of such visits than females (Figure 3). There was little variation in rates across the age groups from ages 18 to 44. However, the ED visit rates were lower for older and younger patients.

In terms of race/ethnicity, 54% of the visits with alcohol in combination involved patients who were white. Evaluating the relative frequencies across the race/ethnicity groups is impeded by missing data; in 11% of visits race/ethnicity was unknown.

Table 5

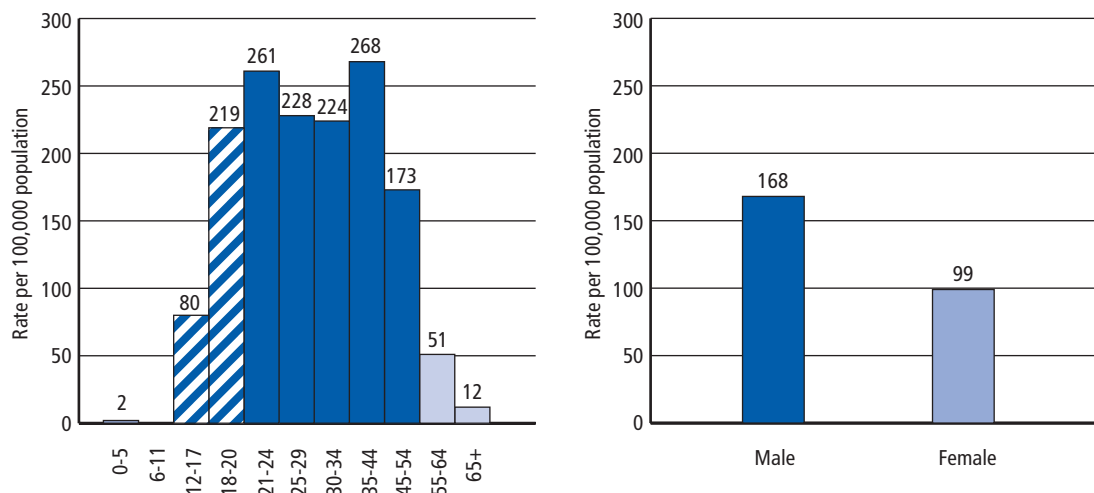
Alcohol in combination, by patient and visit characteristics: 2005

Patient characteristics	Estimated visits ^{1,2}	Visit characteristics	Estimated visits ^{1,2}
ED visits, alcohol in combination	394,224		
Gender		Number of drugs involved	
Male	244,892	Single drug	
Female	149,249	Multiple drugs	394,224
Unknown	83	Alcohol involved	394,224
Age		Disposition	
0-5 years	370	Treated and released	200,072
6-11 years	...	Discharged home	150,338
12-17 years	20,400	Released to police/jail	13,559
18-20 years	27,278	Referred to detox/treatment	36,175
21-24 years	44,049	Admitted to this hospital	132,008
25-29 years	45,812	ICU/critical care	28,065
30-34 years	45,062	Surgery	607
35-44 years	117,423	Chemical dependency/detox	...
45-54 years	73,705	Psychiatric unit	27,518
55-64 years	15,365	Other inpatient unit	48,671
65 years and older	4,379	Other disposition	62,144
Unknown	205	Transferred	41,696
Race/ethnicity		Left against medical advice	7,956
White	214,413	Died	411
Black	84,104	Other	3,973
Hispanic	47,664	Not documented	...
Race/ethnicity not tabulated above (NTA)	4,821		
Unknown	43,222		

¹ These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

² Three dots (...) indicate that an estimate with an RSE greater than 50% or an estimate less than 30 has been suppressed.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).

Figure 3**Alcohol with other drugs, ED visit rates by age and gender: 2005**

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).

Alcohol was most frequently combined with (Table 6):

- Cocaine alone (86,482 visits),
- Marijuana alone (33,643 visits),
- Cocaine and marijuana (22,377 visits), and
- Heroin alone (12,797 visits).

Table 6**Drugs most frequently reported with alcohol: 2005**

Drugs reported with alcohol ¹	Estimated visits ²
No other drug	98,430
Cocaine only	86,482
Marijuana only	33,643
Cocaine and marijuana only	22,377
Heroin only	12,797
Stimulants only	11,290
Alprazolam only	10,138
Cocaine and heroin only	9,692

¹ The classification of drugs used DAWN is derived from the Multum *Lexicon*, © 2005, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2006). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).

Alcohol-related ED visits in patients under the age of 21 (Table 7)

For individuals under age 21, alcohol is an illegal drug, and ED visits related to both alcohol alone and alcohol in combination are reported to DAWN for this age group. Considering alcohol alone and alcohol in combination with other drugs, DAWN estimates:

- 56,978 (CI: 45,810 to 68,146) alcohol-related ED visits for patients aged 12-17, and
- 88,781 (CI: 73,468 to 104,094) alcohol-related ED visits for patients aged 18-20.

Two thirds (67%) of the alcohol-related ED visits for minors involved alcohol alone, a finding that is similar for patients aged 12 to 17 and patients aged 18 to 20 (Table 7).

Table 7

Alcohol in drug-related ED visits in patients under age 21: 2005

Drug category and selected drugs ¹	Estimated visits ²	Relative standard error (RSE)	95% Confidence interval		
			Lower bound	-	Upper bound
Patients aged 12-17					
ED visits, alcohol	56,978	10.0	45,810	-	68,146
Alcohol in combination	20,400	12.1	15,562	-	25,238
Alcohol alone	36,578	10.3	29,194	-	43,962
Patients aged 18-20					
ED visits, alcohol	88,781	8.8	73,468	-	104,094
Alcohol in combination	27,278	8.3	22,840	-	31,716
Alcohol alone	61,503	10.9	48,363	-	74,643

¹ The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2005, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2006). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).

ED visits for underage alcohol use (Tables 4, 8, Figure 4)

For 2005, DAWN estimates 98,430 (CI: 80,258 to 116,602) ED visits related to use of alcohol alone (i.e., not in combination with another drug) by patients who were younger than age 21 (Table 4). Nearly all (98%, or 96,933 visits) of those visits involved underage drinking that was not related to either a suicide attempt or a request for admission to detox or substance abuse treatment program (Table 8).

Taking population size into account, the rate of these alcohol-only ED visits for patients aged 18 to 20 (487 visits per 100,000 population) was 3.5 times that for patients aged 12 to 17 (141 per 100,000). Males and females had similar rates (Figure 4).

In terms of race/ethnicity, 58% of these alcohol-only visits involved patients who were white. Evaluating the relative frequencies of the race/ethnicity groups is impeded by missing data; in 15% of visits, race/ethnicity was unknown (Table 8).

Most (86%) of the alcohol-only ED visits resulted in patients' being treated and released, usually to home; another 7% were admitted to inpatient units (Table 8).

Table 8
Alcohol only (age < 21), by patient and visit characteristics: 2005

Patient characteristics	Estimated visits ^{1,2}	Visit characteristics	Estimated visits ^{1,2}
ED visits, alcohol only (age < 21)³	96,933		
Gender		Number of drugs involved	
Male	55,558	Single drug	96,933
Female	41,365	Multiple drugs	
Unknown	...	Alcohol involved	96,933
Age		Disposition	
0-5 years	167	Treated and released	83,468
6-11 years	...	Discharged home	74,766
12-17 years	35,956	Released to police/jail	7,555
18-20 years	60,694	Referred to detox/treatment	1,148
21-24 years		Admitted to this hospital	7,082
25-29 years		ICU/critical care	2,078
30-34 years		Surgery	310
35-44 years		Chemical dependency/detox	...
45-54 years		Psychiatric unit	439
55-64 years		Other inpatient unit	4,075
65 years and older		Other disposition	6,383
Unknown		Transferred	3,598
Race/ethnicity		Left against medical advice	700
White	57,603	Died	...
Black	7,051	Other	...
Hispanic	15,067	Not documented	1,068
Race/ethnicity not tabulated above (NTA)	2,200		
Unknown	15,011		

¹ These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

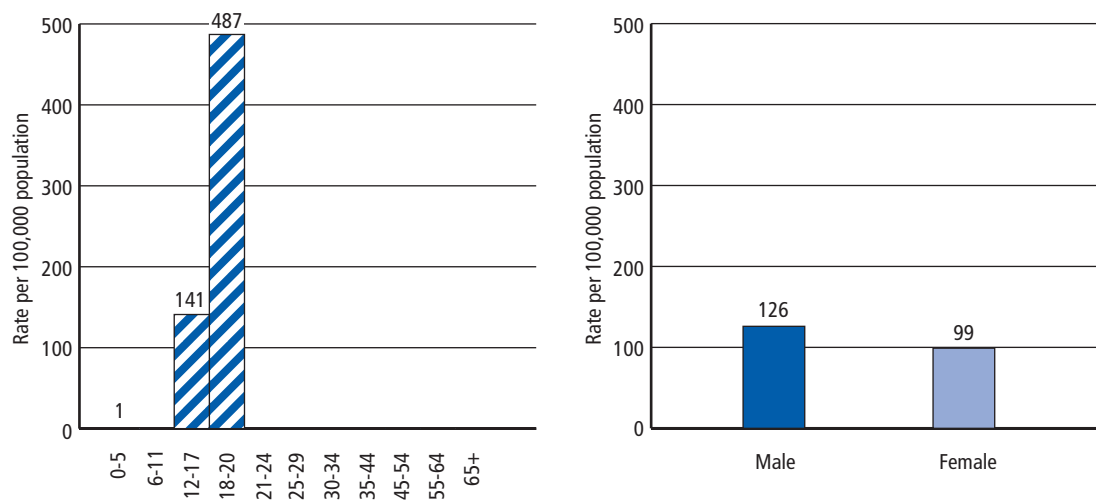
² Three dots (...) indicate that an estimate with an RSE greater than 50% or an estimate less than 30 has been suppressed.

³ This table is limited to ED visits classified as "alcohol only (age < 21)" and excludes visits classified as either "suicide attempt" or "seeking detox." Therefore, the estimate of total visits is slightly lower than that reported in Table 4.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).

Figure 4

Alcohol only (age < 21), ED visit rates by age and gender: 2005



SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).

NONMEDICAL USE OF PHARMACEUTICALS

Use of illicit drugs is, by definition, substance abuse. For pharmaceuticals, however, distinguishing medical from nonmedical use is more complicated.¹³ In DAWN, “medical use” means taking a prescription or over-the-counter (OTC) pharmaceutical as prescribed or recommended, and “nonmedical use” is use that does not meet the definition of medical use. Thus, nonmedical use of pharmaceuticals includes taking more than the prescribed dose of a prescription pharmaceutical or more than the recommended dose of an OTC pharmaceutical or supplement; taking a pharmaceutical prescribed for another individual; deliberate poisoning with a pharmaceutical by another person; and documented misuse or abuse of a prescription or OTC pharmaceutical or dietary supplement. Nonmedical use of pharmaceuticals may involve pharmaceuticals alone or pharmaceuticals in combination with illicit drugs or alcohol.

A cautionary note: DAWN tries to capture only drugs that are related to the ED visit and actively discourages reporting of current medications that are unrelated to the visit. It is important to understand, however, that it is not possible, given the limitations of medical record documentation, to eliminate completely the reporting of current medications, and this should be considered when one interprets these findings.

Nonmedical use of pharmaceuticals (Tables 9-10, Figure 5)

For 2005, DAWN estimates that 598,542 (CI: 486,771 to 710,314) ED visits involved nonmedical use of prescription or OTC pharmaceuticals or dietary supplements (Table 9). The majority of these visits (55%) involved multiple drugs (Table 10):

- One fifth (20%) of all nonmedical-use ED visits involved alcohol,
- One fifth (20%) involved pharmaceuticals in combination with an illicit drug, and
- About 6% involved pharmaceuticals in combination with both alcohol and an illicit drug.

Central nervous system (CNS) agents (51% of nonmedical-use visits) and psychotherapeutic agents (46%) were the most frequent drugs reported in the nonmedical-use category of ED visits (Table 9). Respiratory agents (4%), cardiovascular agents (5%), and all other types of pharmaceuticals were much less frequent.

Among the CNS agents, the most frequently reported drugs were opiate/opioid analgesics (33% of nonmedical-use visits), including single-ingredient (e.g., oxycodone) and combination forms (e.g., hydrocodone with acetaminophen). Methadone and single-ingredient and combination forms of hydrocodone and oxycodone were the most frequent opioids. Once the margin of error is taken into account, these three opioids appeared in similar numbers of visits:

- Hydrocodone/combinations in 51,225 ED visits (CI: 37,416 to 65,033),
- Oxycodone/combinations in 42,810 ED visits (CI: 30,672 to 54,948), and
- Methadone in 41,216 ED visits (CI: 29,249 to 53,184).

¹³ DAWN cases are identified through a retrospective review of medical charts. Given the limitations of medical record documentation, we have concluded that distinguishing misuse from abuse reliably is not feasible.

Table 9**Nonmedical use of pharmaceuticals: 2005**

Selected drug categories and selected drugs ¹	Estimated visits ^{2,3,4}	Relative standard error (RSE)	95% Confidence interval		
			Lower bound	-	Upper bound
ED visits, nonmedical use	598,542	9.5	486,771	-	710,314
PSYCHOTHERAPEUTIC AGENTS	275,430	9.6	223,576	-	327,284
Antidepressants	61,023	8.6	50,726	-	71,320
MAO inhibitors	...	58.8	...	-	...
SSRI antidepressants	27,319	10.3	21,804	-	32,834
Tricyclic antidepressants	12,417	10.7	9,822	-	15,011
Miscellaneous antidepressants	25,577	9.9	20,593	-	30,562
Antipsychotics	37,327	11.6	28,812	-	45,843
Anxiolytics, sedatives, and hypnotics	204,711	10.4	162,841	-	246,580
Barbiturates	11,013	12.8	8,244	-	13,782
Benzodiazepines	172,388	10.8	135,948	-	208,828
Alprazolam	62,020	20.2	37,435	-	86,606
Clonazepam	30,608	14.5	21,896	-	39,320
Diazepam	18,567	10.8	14,633	-	22,502
Lorazepam	19,665	10.9	15,465	-	23,866
Benzodiazepines NOS	45,876	12.7	34,468	-	57,284
Misc. anxiolytics, sedatives, and hypnotics	31,553	11.0	24,741	-	38,365
Diphenhydramine	9,055	10.0	7,272	-	10,838
Hydroxyzine	3,153	17.3	2,084	-	4,223
Zolpidem	12,765	15.0	9,004	-	16,527
Anxiolytics, sedatives and hypnotics NOS	3,391	22.3	1,911	-	4,872
CNS stimulants	10,616	11.1	8,309	-	12,924
Amphetamine-dextroamphetamine	2,836	21.7	1,632	-	4,040
Caffeine	3,103	14.9	2,199	-	4,008
Dextroamphetamine	...	70.4	...	-	...
Methylphenidate	3,212	12.6	2,420	-	4,003
CENTRAL NERVOUS SYSTEM AGENTS	305,973	10.0	246,137	-	365,810
Analgesics	264,857	9.7	214,367	-	315,346
Antimigraine agents	914	21.5	530	-	1,298
Cox-2 inhibitors	1,201	24.3	629	-	1,774
Opiates/opioids	196,225	10.4	156,355	-	236,095
Opiates/opioids, unspecified	39,228	9.3	32,094	-	46,361
Narcotic analgesics	160,363	12.0	122,749	-	197,977
Buprenorphine/combinations	...	65.4	...	-	...
Codeine/combinations	5,550	12.0	4,242	-	6,857
Fentanyl/combinations	9,160	14.8	6,508	-	11,812
Hydrocodone/combinations	51,225	13.8	37,416	-	65,033
Hydromorphone/combinations	5,344	28.4	2,374	-	8,314
Meperidine/combinations	763	32.8	272	-	1,254
Methadone	41,216	14.8	29,249	-	53,184
Morphine/combinations	15,183	22.7	8,413	-	21,953

Table 9 (continued)

Nonmedical use of pharmaceuticals: 2005

Selected drug categories and selected drugs ¹	Estimated visits ^{2,3,4}	Relative standard error (RSE)	95% Confidence interval		
			Lower bound	-	Upper bound
Oxycodone/combinations	42,810	14.5	30,672	-	54,948
Propoxyphene/combinations	6,813	11.6	5,265	-	8,360
Nonsteroidal anti-inflammatory agents	26,050	9.2	21,337	-	30,763
Ibuprofen	19,214	10.4	15,293	-	23,136
Naproxen	5,297	11.4	4,117	-	6,477
Salicylates/combinations	12,093	12.4	9,161	-	15,025
Miscellaneous analgesics/combinations	46,921	11.3	36,542	-	57,301
Acetaminophen/combinations	39,494	11.8	30,333	-	48,655
Tramadol/combinations	4,785	17.3	3,162	-	6,409
Tramadol	4,463	18.2	2,871	-	6,055
Acetaminophen-tramadol	331	31.4	127	-	535
Analgesic combinations not tabulated above (NTA)	839	27.5	387	-	1,291
Anorexiants	1,239	20.5	742	-	1,737
Anticonvulsants	26,688	11.2	20,848	-	32,527
Antiemetic/antivertigo agents	1,721	21.6	992	-	2,450
Anti-Parkinson agents	2,475	22.9	1,364	-	3,585
General anesthetics	...	64.1	...	-	...
Muscle relaxants	31,757	14.0	23,016	-	40,498
Carisoprodol	19,513	19.4	12,076	-	26,949
Cyclobenzaprine	6,432	14.8	4,561	-	8,303
Miscellaneous CNS agents	947	25.2	480	-	1,414
RESPIRATORY AGENTS	26,694	10.4	21,235	-	32,152
Antihistamines	5,869	13.4	4,331	-	7,407
Bronchodilators	2,912	25.6	1,453	-	4,371
Decongestants	1,287	20.9	759	-	1,815
Expectorants	2,127	17.7	1,388	-	2,867
Upper respiratory combinations	12,613	10.9	9,913	-	15,312
Respiratory agents NTA	4,004	14.5	2,863	-	5,145
CARDIOVASCULAR AGENTS	30,246	10.8	23,853	-	36,640
Antiadrenergic agents, centrally acting	3,753	13.7	2,747	-	4,758
Beta-adrenergic blocking agents	8,554	12.6	6,448	-	10,659
Calcium channel blocking agents	3,504	13.8	2,558	-	4,450
Diuretics	5,329	21.4	3,095	-	7,564
Cardiovascular agents NTA	15,349	11.8	11,804	-	18,894

¹ The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2005, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2006). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

³ ED visits often involve multiple drugs. Such visits will appear multiple times in this table (e.g., a visit involving two pharmaceuticals will appear twice in this table). Summing ED visits as reported in this table will produce incorrect and inflated count of ED visits.

⁴ Three dots (...) indicate that an estimate with an RSE greater than 50% or an estimate less than 30 has been suppressed.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).

It is not possible to know, based on the documentation available in ED medical records, the extent to which these drugs came from legitimate prescriptions versus other sources. In addition, it is not possible to distinguish methadone used for treatment of opiate addiction from the methadone in pill form that is prescribed for pain. In fact, methadone may be one of the most ambiguous drugs to categorize in DAWN. When a patient on opioid replacement therapy presents to an ED, methadone may be routinely documented in the medical record, but without sufficient detail to distinguish whether the methadone specifically was related to the ED visit.

The opioids were followed in frequency by the nonopioid analgesics containing acetaminophen (7% of nonmedical-use visits), muscle relaxants (5%), anticonvulsants (4%), and nonsteroidal anti-inflammatory agents (NSAIDs, 4%). DAWN estimates 39,494 (CI: 30,333 to 48,655) nonmedical-use visits involving nonopioid acetaminophen products. The most frequent muscle relaxant in nonmedical-use visits was carisoprodol, which was involved in 19,513 (CI: 12,076 to 26,949), or 3%, of nonmedical-use ED visits in 2005.

Among the psychotherapeutic agents, the anxiolytics (anti-anxiety agents), sedatives, and hypnotics were the most frequent, occurring in a third (34%) of visits associated with nonmedical use of pharmaceuticals. This category of pharmaceuticals includes barbiturates and benzodiazepines. ED visits involving benzodiazepines clearly outnumbered those involving any of the other types of psychotherapeutic agents. DAWN estimates that 172,388 (CI: 135,948 to 208,828) ED visits associated with nonmedical use of pharmaceuticals involved benzodiazepines in 2005. This is comparable to the number for the prescription opiates/opioids.

According to DAWN, the most frequently named benzodiazepines were alprazolam in 62,020 (CI: 37,435 to 86,606) ED visits and clonazepam in 30,608 (CI: 21,896 to 39,320) ED visits. Benzodiazepines without a specific ingredient named appeared in comparable numbers: 45,876 (CI: 34,468 to 57,284) ED visits. Benzodiazepines occurring less frequently but still in substantial numbers included lorazepam in 19,665 (CI: 15,465 to 23,866) ED visits and diazepam in 18,567 (CI: 14,633 to 22,502) ED visits.

Among the other anxiolytics, sedatives, and hypnotics, the following drugs appeared in similar numbers of nonmedical-use ED visits:

- Zolpidem in 12,765 ED visits (CI: 9,004 to 16,527),
- Barbiturates, which are primarily unnamed, in 11,013 ED visits (CI: 8,244 to 13,782), and
- Diphenhydramine¹⁴ in 9,055 ED visits (CI: 7,272 to 10,838).

For the ED visits associated with nonmedical use of pharmaceuticals, other psychotherapeutic agents of interest include antidepressants and antipsychotics. DAWN estimates:

- Antidepressants in 61,023 ED visits (CI: 50,726 to 71,320), and
- Antipsychotics, such as quetiapine, in 37,327 ED visits (CI: 28,812 to 45,843).

¹⁴ This includes only single-ingredient formulations. Many multi-ingredient pharmaceuticals containing diphenhydramine are classified elsewhere, e.g., as respiratory agents.

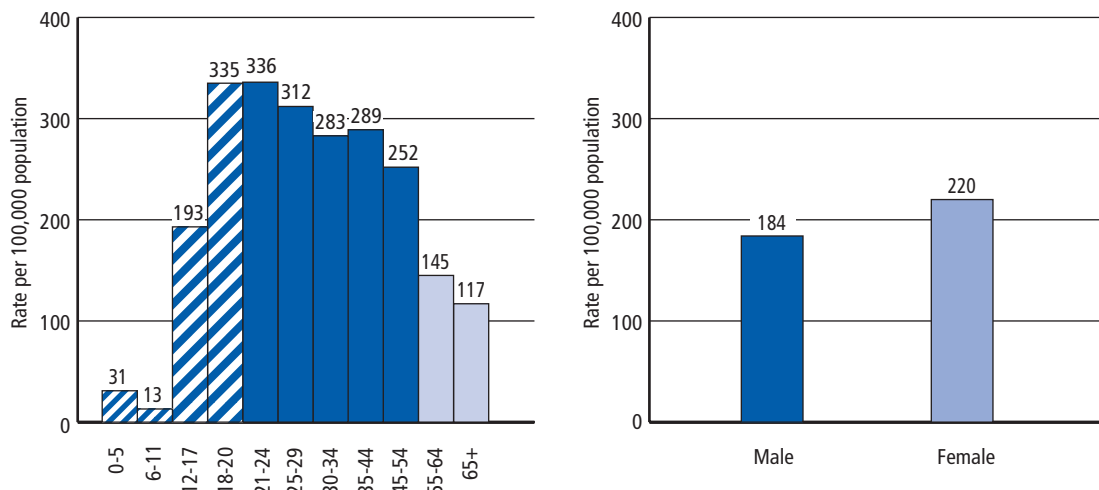
Methylphenidate, a CNS stimulant that has recently captured much attention, occurs much less frequently. DAWN estimates that 3,212 (CI: 2,420 to 4,003) nonmedical-use ED visits involved methylphenidate.

Taking population size and the margin of error into account, visits for nonmedical use of pharmaceuticals did not differ between females (220 visits per 100,000 population) and males (184 visits per 100,000 population) (Figure 5). In terms of age, visit rates were highest for patients aged 18 to 54 and were lowest for patients aged 11 and younger.

In terms of race and ethnicity, 66% of visits related to nonmedical use of pharmaceuticals involved patients who were white (Table 10). Evaluating the relative frequencies of the race/ethnicity groups is impeded by missing data; in 13% of visits, race/ethnicity was unknown.

Patients were treated and released in about half (55%) of ED visits associated with nonmedical use of pharmaceuticals, with most discharged home (88%) and only 8% referred to detox or substance abuse treatment. In one third (33%) of all nonmedical-use visits, patients were admitted to inpatient hospital units (Table 10). Of those admitted to the hospital, about one third (33%) were sent to a critical care unit, about 15% to a psychiatric unit, and about half (48%) to other inpatient units. About 7% of ED visits for nonmedical use of pharmaceuticals resulted in transfers to another health care facility.

Figure 5
Nonmedical use of pharmaceuticals, ED visit rates by age and gender: 2005



SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).

Table 10**Nonmedical use of pharmaceuticals, by patient and visit characteristics: 2005**

Patient characteristics	Estimated visits ^{1,2}	Visit characteristics	Estimated visits ^{1,2}
ED visits, nonmedical use	598,542		
Gender		Number of drugs involved	
Male	267,945	Single drug	271,826
Female	330,319	Multiple drugs	326,717
Unknown	279		
Age		Disposition	
0-5 years	7,412	Treated and released	331,796
6-11 years	3,124	Discharged home	290,467
12-17 years	49,145	Released to police/jail	13,794
18-20 years	41,662	Referred to detox/treatment	27,535
21-24 years	56,565	Admitted to this hospital	200,122
25-29 years	62,640	ICU/critical care	65,674
30-34 years	56,759	Surgery	632
35-44 years	126,756	Chemical dependency/detox	...
45-54 years	107,149	Psychiatric unit	30,655
55-64 years	44,028	Other inpatient unit	95,368
65 years and older	43,035	Other disposition	66,624
Unknown	267	Transferred	44,750
Race/ethnicity		Left against medical advice	10,313
White	397,919	Died	1,365
Black	68,397	Other	3,868
Hispanic	46,957	Not documented	6,328
Race/ethnicity not tabulated above (NTA)	6,944		
Unknown	78,325		

¹ These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

² Three dots (...) indicate that an estimate with an RSE greater than 50% or an estimate less than 30 has been suppressed.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).

COMPARISONS OF ED VISITS IN 2004 AND 2005

The 2005 estimates from DAWN provide the first opportunity since the redesign of DAWN to examine changes over time in drug-related emergency department (ED) visits. This chapter presents comparisons of ED visit estimates for 2004 and 2005, with differences between 2004 and 2005 presented in terms of the percent change in ED visits. Only statistically significant changes are discussed and denoted with a percent change in the tables. However, with only two years' estimates to compare, we urge caution in interpreting these as trends.

Drug misuse and abuse in ED visits (Table 11)

In 2005, hospitals in the United States delivered a total of 108 million ED visits, an increase of 2.3% over 2004. The population of the United States increased 0.9%, from 294 million to 296 million, over the same period.

According to DAWN, the number of ED visits attributable to drug misuse and abuse was stable from 2004 to 2005 (Table 11).¹⁵ That is, the apparent difference is within the margin of error. Across the different types of drug involvement, only one change was noted and that was for visits involving pharmaceuticals alone (i.e., with no other type of drug), which increased 26%. It is worthwhile to consider, however, that the number of pharmaceuticals dispensed for legitimate therapeutic uses may be increasing over time, and DAWN estimates are not adjusted to take this into account. Nor do DAWN estimates take into account the increases in the population and in ED use mentioned above.

Table 11

Drug misuse and abuse in ED visits in the U.S., by type of drug involvement: 2004 and 2005

Drug involvement ¹	Estimated visits ²		Percent change 2004, 2005 ³
	2004	2005	
All types of drug misuse/abuse	1,253,956	1,449,154	
Illicit drugs only	379,609	450,296	26%
Alcohol only (age < 21)	98,052	98,364	
Pharmaceuticals only	313,125	395,617	
Combinations			
Illicit drugs with alcohol	190,747	199,008	
Illicit drugs with pharmaceuticals	99,535	110,652	
Alcohol with pharmaceuticals	125,374	138,477	
Illicit drugs with alcohol and pharmaceuticals	47,515	56,740	

¹ The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2005, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2006). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

³ This column denotes statistically significant ($p < 0.05$) increases or decreases between estimates for the periods shown.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).

¹⁵ Changes in the classification of drugs that occurred in 2005 have been applied retrospectively to 2004. This resulted in minor changes to the estimates published previously for 2004.

Illicit drugs in ED visits (Table 12)

No changes in ED visits from 2004 to 2005 were detected for any of the major illicit drugs: cocaine, heroin, stimulants, hallucinogens, etc.

Table 12
Illicit drugs in ED visits: 2004 and 2005

Drug category and selected drugs ¹	Estimated visits ²		Percent change 2004, 2005 ³
	2004	2005	
Total drug misuse/abuse ED visits	1,253,956	1,449,154	
ED visits, illicit drugs	717,405	816,696	
Cocaine	383,350	448,481	
Heroin	162,138	164,572	
Marijuana	215,665	242,200	
Stimulants	102,843	138,950	
Amphetamines	32,686	35,827	
Methamphetamine	73,400	108,905	
MDMA (Ecstasy)	8,621	10,752	
GHB	2,340	1,861	
Flunitrazepam (Rohypnol)	473	596	
Ketamine	227	275	
LSD	1,953	1,864	
PCP	8,928	7,535	
Miscellaneous hallucinogens	3,445	3,792	
Inhalants	9,275	4,312	-54%
Combinations not tabulated above (NTA)	1,522	1,755	

¹ The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2005, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2006). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

³ This column denotes statistically significant ($p < 0.05$) increases or decreases between estimates for the periods shown.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).

Alcohol in ED visits (Tables 13-14)

No significant changes in alcohol-related ED visits occurred between 2004 and 2005 (Tables 13-14). This finding applied equally to all the alcohol-related ED visits: alcohol overall, alcohol in combination with other drugs, and alcohol alone in underage patients.

Table 13

Alcohol in drug-related ED visits: 2004 and 2005

Drug category and selected drugs ¹	Estimated visits ²		Percent change 2004, 2005 ³
	2004	2005	
Total drug misuse/abuse ED visits	1,253,956	1,449,154	
ED visits, alcohol	461,809	492,655	
Alcohol in combination	363,635	394,224	
Alcohol alone	98,174	98,430	

¹ The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2005, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2006). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

³ This column denotes statistically significant ($p < 0.05$) increases or decreases between estimates for the periods shown.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).

Table 14

Alcohol in drug-related ED visits in patients under age 21: 2004 and 2005

Drug category and selected drugs ¹	Estimated visits ²		Percent change 2004, 2005 ³
	2004	2005	
Patients aged 12-17			
ED visits, alcohol	60,118	56,978	
Alcohol in combination	19,605	20,400	
Alcohol alone	40,512	36,578	
Patients aged 18-20			
ED visits, alcohol	82,583	88,781	
Alcohol in combination	25,676	27,278	
Alcohol alone	56,907	61,503	

¹ The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2005, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2006). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

³ This column denotes statistically significant ($p < 0.05$) increases or decreases between estimates for the periods shown.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).

Nonmedical use of pharmaceuticals (Table 15)

Overall, ED visits related to nonmedical use of pharmaceuticals increased 21% from 2004 to 2005 (Table 15). Among the pharmaceuticals most frequently implicated in nonmedical use, the following changes are notable:

- Benzodiazepines increased 19%,
- Opiates/opioids increased 24% overall, with unspecified opiates increasing 33%, and
- Methadone increased 29%.

The Cox-2 inhibitors were the only pharmaceuticals showing a decrease in ED visits related to nonmedical use. This may be a reflection of the decrease in medical use of Cox-2 inhibitors, which was associated with three events. First, Merck withdrew Vioxx from the marketplace in September 2004, citing cardiovascular risks. Then, in April 2005, Pfizer withdrew Bextra in response to a request by the Food and Drug Administration (FDA), and the FDA added a new warning label to Celebrex.¹⁶

Table 15
Nonmedical use of pharmaceuticals ED visits: 2004 and 2005

Drug category and selected drugs ¹	Estimated visits ^{2,3}		Percent change 2004, 2005 ⁴
	2004	2005	
ED visits, nonmedical use	495,732	598,542	21%
PSYCHOTHERAPEUTIC AGENTS	239,829	275,430	
Antidepressants	62,743	61,023	
MAO inhibitors	...	...
SSRI antidepressants	30,817	27,319	
Tricyclic antidepressants	10,897	12,417	
Miscellaneous antidepressants	25,218	25,577	
Antipsychotics	30,846	37,327	21%
Anxiolytics, sedatives, and hypnotics	175,115	204,711	
Barbiturates	11,064	11,013	
Benzodiazepines	144,385	172,388	19%
Alprazolam	49,842	62,020	
Clonazepam	26,238	30,608	
Diazepam	15,733	18,567	
Lorazepam	16,926	19,665	
Benzodiazepines NOS	37,081	45,876	

¹⁶ Decreases in medical use of Cox-2 inhibitors were documented in a report citing data from IMS Health from 1999 to 2004. Richard Knox (2004, September 30). Merck Pulls Arthritis Drug Vioxx from Market. Retrieved August 25, 2006, from National Public Radio Web site: <http://www.npr.org/templates/story/story.php?storyId=4054991>.

Table 15 (continued)

Nonmedical use of pharmaceuticals ED visits: 2004 and 2005

Drug category and selected drugs ¹	Estimated visits ^{2,3}		Percent change 2004, 2005 ⁴
	2004	2005	
Misc. anxiolytics, sedatives, and hypnotics	28,304	31,553	
Diphenhydramine	9,330	9,055	
Hydroxyzine	2,468	3,153	
Zolpidem	11,362	12,765	
Anxiolytics, sedatives, and hypnotics NOS	2,722	3,391	
CNS stimulants	7,972	10,616	33%
Amphetamine-dextroamphetamine	2,227	2,836	
Caffeine	2,787	3,103	
Dextroamphetamine	408	...	
Methylphenidate	1,541	3,212	108%
CENTRAL NERVOUS SYSTEM AGENTS	261,581	305,973	
Analgesics	222,832	264,857	
Antimigraine agents	467	914	
Cox-2 inhibitors	2,641	1,201	-55%
Opiates/opioids	158,284	196,225	24%
Opiates/opioids, unspecified	29,463	39,228	33%
Narcotic analgesics	132,207	160,363	21%
Buprenorphine/combinations	236	...	
Codeine/combinations	5,836	5,550	
Fentanyl/combinations	8,000	9,160	
Hydrocodone/combinations	42,491	51,225	
Hydromorphone/combinations	2,779	5,344	92%
Meperidine/combinations	1,310	763	
Methadone	31,874	41,216	29%
Morphine/combinations	12,558	15,183	
Oxycodone/combinations	36,559	42,810	
Propoxyphene/combinations	6,448	6,813	
Nonsteroidal anti-inflammatory agents	22,959	26,050	
Ibuprofen	17,931	19,214	
Naproxen	4,817	5,297	
Salicylates/combinations	11,820	12,093	
Miscellaneous analgesics/combinations	41,508	46,921	
Acetaminophen/combinations	36,818	39,494	
Tramadol/combinations	3,725	4,785	
Tramadol	2,984	4,463	
Acetaminophen-tramadol	743	331	
Analgesic combinations not tabulated above (NTA)	1,195	839	

Table 15 (continued)

Nonmedical use of pharmaceuticals ED visits: 2004 and 2005

Drug category and selected drugs ¹	Estimated visits ^{2,3}		Percent change 2004, 2005 ⁴
	2004	2005	
Anorexiant	1,336	1,239	
Anticonvulsants	26,926	26,688	
Antiemetic/antivertigo agents	1,457	1,721	
Anti-Parkinson agents	1,615	2,475	
General anesthetics	...	...
Muscle relaxants	28,338	31,757	
Carisoprodol	17,366	19,513	
Cyclobenzaprine	5,932	6,432	
Miscellaneous CNS agents	854	947	
RESPIRATORY AGENTS	20,342	26,694	31%
Antihistamines	5,148	5,869	
Bronchodilators	2,351	2,912	
Decongestants	1,468	1,287	
Expectorants	1,258	2,127	
Upper respiratory combinations	9,433	12,613	
Respiratory agents NTA	1,979	4,004	102%
CARDIOVASCULAR AGENTS	27,286	30,246	
Antiadrenergic agents, centrally acting	3,752	3,753	
Beta-adrenergic blocking agents	7,014	8,554	
Calcium channel blocking agents	2,465	3,504	
Diuretics	3,968	5,329	
Cardiovascular agents NTA	14,886	15,349	

¹ The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2005, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2006). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

³ Three dots (...) indicate that an estimate with an RSE greater than 50% or an estimate less than 30 has been suppressed.

⁴ This column denotes statistically significant ($p < 0.05$) increases or decreases between estimates for the periods shown.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).

SPECIAL TYPES OF DRUG-RELATED ED VISITS

This chapter profiles two special types of drug-related ED visits captured by DAWN. Drug-related suicide attempts and seeking detox cases are considered as separate and distinct classes of drug misuse or abuse.

Suicide attempts (Tables 16-17, Figure 6)

DAWN estimates 132,582 (CI: 113,283 to 151,882) ED visits for drug-related suicide attempts in 2005 (Table 16). Although DAWN includes only suicide attempts that involve drugs, these attempts are not limited to drug overdoses. If there is drug involvement in a suicide attempt by other means (e.g., by gun), the case is included as drug related. However, suicide attempts not involving drugs at all (e.g., by gun alone) are excluded. Also excluded are suicide-related behaviors documented as something other than actual attempts (e.g., suicidal ideation, suicidal gesture, or suicidal thoughts).

Nearly two thirds of ED visits for drug-related suicide attempts (63%) involved multiple drugs (Table 17). Alcohol in combination with other drugs or alcohol alone in patients under age 21 was the most frequently implicated drug and was involved in one third (33%) of the ED visits for drug-related suicide attempts. Since DAWN excludes visits for adults when alcohol is the only drug, the role of alcohol in suicide attempts is probably larger. Illicit drugs were involved in approximately one fifth (19%) of the ED visits for drug-related suicide attempts. The most frequently reported illicit drugs were cocaine (11% of visits) and marijuana (7% of visits), but the margins of error for the illicit drugs are quite large and the numbers are relatively small when compared with the pharmaceuticals.

Pharmaceuticals were involved in the majority (93%) of ED visits for drug-related suicide attempts, and it is not possible, based on ED medical record documentation, to measure the extent to which these pharmaceuticals may have been prescribed to the patient for a preexisting condition. More than half (56%) of ED visits for drug-related suicide attempts involved psychotherapeutic agents, and 45% involved central nervous system (CNS) agents. The most commonly used psychotherapeutic agents were benzodiazepines (27%) and antidepressants (19%). The CNS agents were primarily analgesics (pain relievers) and included both prescription and over-the-counter (OTC) formulations. DAWN estimates that the most commonly used pain relievers were acetaminophen/combinations and opiates/opioids, which were each present in approximately a third (31% and 29%, respectively) of suicide-attempt visits involving CNS agents, followed by nonsteroidal anti-inflammatory agents (NSAIDs, such as ibuprofen and naproxen, 22%), and salicylates/combinations (aspirins, 8%).

About half (51%) of the suicide attempts were admitted for inpatient hospital care, and a fifth (21%) were admitted to an ICU/critical care unit. Others were admitted to psychiatric units (13%) or other inpatient units (17%). Another 26% were transferred to another health care facility; only 13% were discharged home. Very few (0.2%) died in the ED. However, DAWN does not record deaths for patients who died before arriving at the ED or patients who died after admission to inpatient units of the hospital.

Table 16**Suicide attempts: 2005**

Drug category and selected drugs ¹	Estimated visits ^{2,3,4}	Relative standard error (RSE)	95% Confidence interval		
			Lower bound	-	Upper bound
Total drug-related ED visits, suicide attempts	132,582	7.4	113,283	-	151,882
Major substances of abuse					
Alcohol	43,931	8.5	36,582	-	51,281
Alcohol in combination	42,831	8.5	35,688	-	49,974
Alcohol alone	1,100	27.5	508	-	1,693
Non-alcohol illicit	25,308	9.7	20,495	-	30,121
Cocaine	14,474	12.1	11,048	-	17,900
Heroin	2,764	23.5	1,490	-	4,039
Marijuana	9,142	14.7	6,505	-	11,778
Stimulants	4,771	24.2	2,505	-	7,037
Amphetamines	1,719	21.4	998	-	2,441
Methamphetamine	3,155	31.3	1,221	-	5,088
MDMA (Ecstasy)	339	29.7	142	-	536
GHB	...	0.0	...	-	...
Flunitrazepam (Rohypnol)	...	0.0	...	-	...
Ketamine	...	36.2	...	-	...
LSD	...	32.5	...	-	...
PCP	695	25.9	342	-	1,048
Miscellaneous hallucinogens	...	84.0	...	-	...
Inhalants	634	29.3	270	-	998
Combinations not tabulated above (NTA)	...	63.0	...	-	...
Other substances					
PSYCHOTHERAPEUTIC AGENTS	74,778	7.3	64,090	-	85,465
Antidepressants	25,354	8.1	21,339	-	29,369
MAO inhibitors	...	42.7	...	-	...
SSRI antidepressants	12,900	8.1	10,859	-	14,940
Tricyclic antidepressants	2,839	12.1	2,168	-	3,511
Miscellaneous antidepressants	11,842	10.6	9,380	-	14,305
Antipsychotics	14,215	8.1	11,956	-	16,474
Anxiolytics, sedatives, and hypnotics	49,186	8.1	41,359	-	57,013
Barbiturates	1,231	22.5	688	-	1,774
Benzodiazepines	36,432	8.6	30,276	-	42,588
Alprazolam	13,752	13.1	10,213	-	17,290
Clonazepam	10,529	12.6	7,928	-	13,129
Diazepam	3,839	14.4	2,757	-	4,921
Lorazepam	5,269	10.7	4,161	-	6,377
Benzodiazepines NOS	3,989	21.3	2,320	-	5,657

Table 16 (continued)
Suicide attempts: 2005

Drug category and selected drugs ¹	Estimated visits ^{2,3,4}	Relative standard error (RSE)	95% Confidence interval		
			Lower bound	-	Upper bound
Misc. anxiolytics, sedatives, and hypnotics	13,950	8.7	11,559	-	16,341
Diphenhydramine	5,067	10.5	4,027	-	6,106
Hydroxyzine	964	18.1	622	-	1,307
Zolpidem	4,683	13.1	3,483	-	5,883
Anxiolytics, sedatives, and hypnotics NOS	1,643	18.7	1,042	-	2,244
CNS stimulants	1,705	17.8	1,111	-	2,299
Amphetamine-dextroamphetamine	254	36.4	73	-	434
Caffeine	425	31.3	164	-	686
Dextroamphetamine	...	77.5	...	-	...
Methylphenidate	673	33.3	233	-	1,112
CENTRAL NERVOUS SYSTEM AGENTS	59,577	8.0	50,253	-	68,901
Analgesics	47,995	7.6	40,821	-	55,168
Antimigraine agents	99	40.3	21	-	176
Cox-2 inhibitors	418	27.4	194	-	643
Opiates/opioids	17,524	10.7	13,848	-	21,199
Opiates/opioids, unspecified	1,749	21.6	1,009	-	2,489
Narcotic analgesics	15,944	11.8	12,265	-	19,623
Buprenorphine/combinations	...	0.0	...	-	...
Codeine/combinations	1,424	14.1	1,031	-	1,817
Fentanyl/combinations	...	57.5	...	-	...
Hydrocodone/combinations	8,320	11.7	6,416	-	10,224
Hydromorphone/combinations	197	45.0	23	-	372
Meperidine/combinations	346	46.2	33	-	660
Methadone	1,628	35.4	498	-	2,759
Morphine/combinations	748	28.4	332	-	1,163
Oxycodone/combinations	3,014	14.9	2,135	-	3,894
Propoxyphene/combinations	1,700	17.0	1,133	-	2,268
Nonsteroidal anti-inflammatory agents	13,114	8.2	10,994	-	15,234
Ibuprofen	9,934	8.6	8,262	-	11,607
Naproxen	3,276	14.2	2,366	-	4,185
Salicylates/combinations	4,763	13.4	3,514	-	6,012
Miscellaneous analgesics/combinations	19,542	8.5	16,270	-	22,814
Acetaminophen/combinations	18,275	9.1	15,022	-	21,529
Tramadol/combinations	1,199	17.9	778	-	1,620
Tramadol	1,008	20.1	612	-	1,404
Acetaminophen-tramadol	197	37.5	52	-	341
Analgesic combinations NTA	407	36.4	117	-	698

Table 16 (continued)
Suicide attempts: 2005

Drug category and selected drugs ¹	Estimated visits ^{2,3,4}	Relative standard error (RSE)	95% Confidence interval		
			Lower bound	-	Upper bound
Anorexiant	225	39.8	49	-	400
Anticonvulsants	8,591	9.3	7,023	-	10,159
Antiemetic/antivertigo agents	172	45.9	17	-	327
Anti-Parkinson agents	630	33.9	211	-	1,049
General anesthetics	...	...	...	-	...
Muscle relaxants	6,294	14.7	4,476	-	8,113
Carisoprodol	2,452	20.6	1,463	-	3,442
Cyclobenzaprine	2,601	19.2	1,623	-	3,580
Miscellaneous CNS agents	...	92.9	...	-	...
RESPIRATORY AGENTS	6,805	11.2	5,306	-	8,304
Antihistamines	1,915	15.8	1,322	-	2,508
Bronchodilators	400	39.6	89	-	711
Decongestants	272	40.2	58	-	487
Expectorants	386	41.3	74	-	698
Upper respiratory combinations	3,473	12.8	2,604	-	4,342
Respiratory agents NTA	934	23.7	501	-	1,367
CARDIOVASCULAR AGENTS	7,090	12.5	5,351	-	8,829
Antiadrenergic agents, centrally acting	1,063	23.6	572	-	1,555
Beta-adrenergic blocking agents	2,256	15.6	1,568	-	2,944
Calcium channel blocking agents	437	25.9	215	-	659
Diuretics	1,350	22.1	767	-	1,934
Cardiovascular agents NTA	2,950	16.2	2,016	-	3,884

¹ The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2005, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2006). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

³ Estimates are all expressed in visits. Visits cannot be summed across drugs because drug-related ED visits often involve multiple drugs.

⁴ Three dots (...) indicate that an estimate with an RSE greater than 50% or an estimate less than 30 has been suppressed.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).

Table 17**Suicide attempts, by patient and visit characteristics: 2005**

Patient characteristics	Estimated visits ^{1,2}	Visit characteristics	Estimated visits ^{1,2}
Total drug-related ED visits, suicide attempts	132,582		
Gender		Number of drugs involved	
Male	50,254	Single drug	48,657
Female	82,132	Multiple drugs	83,925
Unknown	...		
Age		Disposition	
0-5 years	...	Treated and released	25,770
6-11 years	62	Discharged home	17,714
12-17 years	15,936	Released to police/jail	2,658
18-20 years	13,698	Referred to detox/treatment	5,399
21-24 years	14,534	Admitted to this hospital	67,659
25-29 years	14,470	ICU/critical care	28,007
30-34 years	13,798	Surgery	...
35-44 years	32,322	Chemical dependency/detox	320
45-54 years	19,596	Psychiatric unit	17,409
55-64 years	5,325	Other inpatient unit	21,874
65 years and older	2,828	Other disposition	39,153
Unknown	...	Transferred	35,083
Race/ethnicity		Left against medical advice	810
White	81,169	Died	210
Black	14,685	Other	1,010
Hispanic	16,894	Not documented	2,040
Race/ethnicity NTA	2,347		
Unknown	17,487		

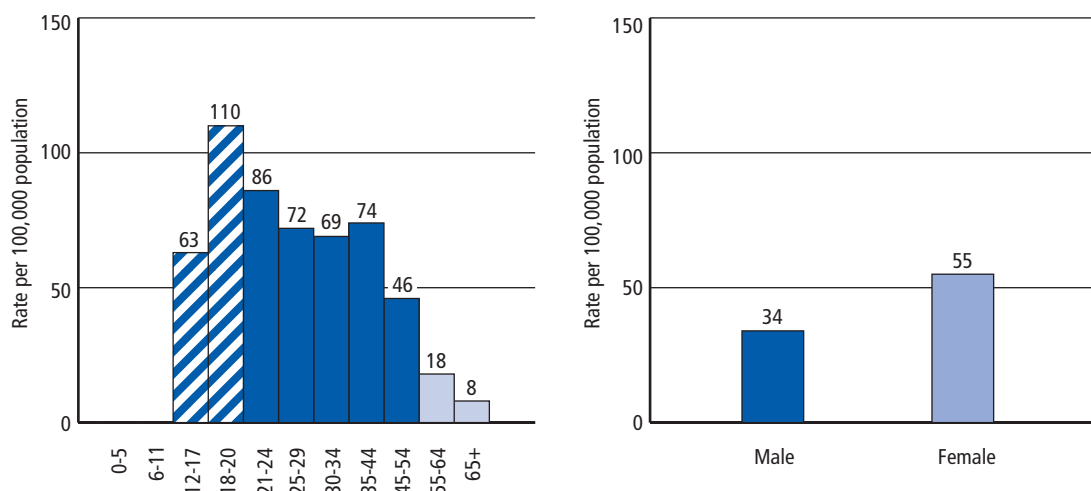
¹ These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

² Three dots (...) indicate that an estimate with an RSE greater than 50% or an estimate less than 30 has been suppressed.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).

After accounting for population size and the margin of error, the rate of drug-related suicide visits for females (55 visits per 100,000 population) was higher than that for males (34 per 100,000) (Figure 6). The rates for patients aged 18 to 20 exceeded the rates for younger and older age groups. The rate for patients aged 12 to 17 (63 visits per 100,000) exceeded the rates for patients aged 45 and over.

In terms of race/ethnicity, 61% of the suicide attempts involved patients who were white. Evaluating the relative frequencies of the race/ethnicity groups is impeded by missing data; in 13% of visits, race/ethnicity was unknown.

Figure 6**Suicide attempts, ED visit rates by age and gender: 2005**

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).

Suicide attempt ED visits: 2004 and 2005 (Table 18)

Overall there was no significant change in ED visits for drug-related suicide attempts from 2004 to 2005 (Table 18). Neither were significant changes found for any of the drugs frequently involved in these suicide attempts.

Table 18**Suicide attempts: 2004 and 2005**

Drug category and selected drugs ¹	Estimated visits ^{2,3}		Percent change 2004, 2005 ⁴
	2004	2005	
Total drug-related ED visits, suicide attempts	121,585	132,582	
Major substances of abuse			
Alcohol	37,414	43,931	
Alcohol in combination	36,702	42,831	
Alcohol alone	712	1,100	
Cocaine	13,940	14,474	
Heroin	2,986	2,764	
Marijuana	9,747	9,142	
Stimulants	4,218	4,771	
Amphetamines	1,894	1,719	
Methamphetamine	2,391	3,155	
MDMA (Ecstasy)	278	339	
GHB	...	...

Table 18 (continued)

Suicide attempts: 2004 and 2005

Drug category and selected drugs ¹	Estimated visits ^{2,3}		Percent change 2004, 2005 ⁴
	2004	2005	
Flunitrazepam (Rohypnol)	239%
Ketamine	...	...
LSD	...	...
PCP	418	695	
Miscellaneous hallucinogens	...	...
Inhalants	187	634	
Combinations not tabulated above (NTA)	...	...
Other substances			
PSYCHOTHERAPEUTIC AGENTS	68,238	74,778	-42%
Antidepressants	26,787	25,354	
MAO inhibitors	...	...
SSRI antidepressants	13,968	12,900	
Tricyclic antidepressants	2,561	2,839	
Miscellaneous antidepressants	12,150	11,842	
Antipsychotics	12,830	14,215	
Anxiolytics, sedatives, and hypnotics	42,967	49,186	
Barbiturates	1,004	1,231	
Benzodiazepines	31,695	36,432	
Alprazolam	11,451	13,752	
Clonazepam	8,370	10,529	
Diazepam	3,571	3,839	
Lorazepam	4,973	5,269	
Benzodiazepines NOS	3,619	3,989	
Misc. anxiolytics, sedatives, and hypnotics	12,988	13,950	
Diphenhydramine	4,718	5,067	
Hydroxyzine	1,672	964	
Zolpidem	4,408	4,683	
Anxiolytics, sedatives, and hypnotics NOS	1,140	1,643	
CNS stimulants	1,457	1,705	
Amphetamine-dextroamphetamine	289	254	
Caffeine	...	425	
Dextroamphetamine	...	...
Methylphenidate	348	673	
CENTRAL NERVOUS SYSTEM AGENTS	56,763	59,577	-41%
Analgesics	46,259	47,995	
Antimigraine agents	299	99	
Cox-2 inhibitors	708	418	
Opiates/opioids	16,889	17,524	

Table 18 (continued)

Suicide attempts: 2004 and 2005

Drug category and selected drugs ¹	Estimated visits ^{2,3}		Percent change 2004, 2005 ⁴
	2004	2005	
Opiates/opioids, unspecified	1,874	1,749	
Narcotic analgesics	15,133	15,944	
Buprenorphine/combinations	...	...
Codeine/combinations	1,431	1,424	
Fentanyl/combinations	...	...
Hydrocodone/combinations	7,325	8,320	
Hydromorphone/combinations	...	197	
Meperidine/combinations	...	346	
Methadone	1,207	1,628	
Morphine/combinations	683	748	
Oxycodone/combinations	3,324	3,014	
Propoxyphene/combinations	2,088	1,700	
Nonsteroidal anti-inflammatory agents	11,594	13,114	
Ibuprofen	8,063	9,934	
Naproxen	3,199	3,276	
Salicylates/combinations	5,068	4,763	
Miscellaneous analgesics/combinations	19,019	19,542	
Acetaminophen/combinations	17,340	18,275	
Tramadol/combinations	1,427	1,199	
Tramadol	1,045	1,008	
Acetaminophen-tramadol	545	197	
Analgesic combinations NTA	428	407	
Anorexiant	115	225	
Anticonvulsants	8,643	8,591	
Antiemetic/antivertigo agents	...	172	
Anti-Parkinson agents	246	630	
General anesthetics	...	...
Muscle relaxants	5,829	6,294	
Carisoprodol	2,489	2,452	
Cyclobenzaprine	1,996	2,601	
Miscellaneous CNS agents	...	...

Table 18 (continued)**Suicide attempts: 2004 and 2005**

Drug category and selected drugs ¹	Estimated visits ^{2,3}		Percent change 2004, 2005 ⁴
	2004	2005	
RESPIRATORY AGENTS	5,879	6,805	
Antihistamines	1,384	1,915	
Bronchodilators	400	400	
Decongestants	429	272	
Expectorants	347	386	
Upper respiratory combinations	3,098	3,473	
Respiratory agents NTA	625	934	
CARDIOVASCULAR AGENTS	6,258	7,090	
Antiadrenergic agents, centrally acting	592	1,063	80%
Beta-adrenergic blocking agents	2,205	2,256	
Calcium channel blocking agents	766	437	
Diuretics	459	1,350	194%
Cardiovascular agents NTA	3,007	2,950	

¹ The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2005, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2006). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

³ Three dots (...) indicate that an estimate with an RSE greater than 50% or an estimate less than 30 has been suppressed.

⁴ This column denotes statistically significant ($p < 0.05$) increases or decreases between estimates for the periods shown.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).

Seeking detox (Tables 19-20, Figure 7)

DAWN estimates 174,141 (CI: 59,348 to 288,933) drug-related ED visits for patients seeking detoxification or substance abuse treatment services during 2005. These "seeking detox" visits tend to be concentrated in hospitals with administrative practices that require medical clearance in the ED for admission to detox or substance abuse treatment units within the hospital. Therefore, these visits do not encompass the full extent of the demand for these services from this estimate.

Nearly two thirds (64%) of the seeking detox ED visits involved multiple drugs, and more than one third (36%) of all seeking detox ED visits involved alcohol. However, the role of alcohol may be underrepresented here, because for adults aged 21 and older this includes only alcohol in combination with other drugs. Among the illicit drugs, cocaine (45% of visits) and heroin (26% of visits) occurred most frequently, followed by marijuana (14% of visits) and amphetamine or methamphetamine stimulants (10% of visits). Estimates for most pharmaceuticals are too imprecise for publication.¹⁷

¹⁷ This is not wholly unexpected since the numbers of seeking detox ED visits can vary dramatically across hospitals, and the presence of specialized detoxification or substance abuse treatment units is not accounted for in the DAWN sample design.

Table 19
Seeking detox: 2005

Drug category and selected drugs ¹	Estimated visits ^{2,3,4}	Relative standard error (RSE)	95% Confidence interval		
			Lower bound	-	Upper bound
Total drug-related ED visits, seeking detox	174,141	33.6	59,348	-	288,933
Major substances of abuse					
Alcohol	62,134	26.1	30,337	-	93,930
Alcohol in combination	61,737	26.1	30,095	-	93,378
Alcohol alone	397	30.5	160	-	634
Non-alcohol illicit	122,936	24.1	64,832	-	181,039
Cocaine	78,242	29.6	32,862	-	123,622
Heroin	44,804	16.4	30,409	-	59,199
Marijuana	24,801	23.2	13,517	-	36,084
Stimulants	16,730	32.9	5,947	-	27,513
Amphetamines	2,713	42.7	441	-	4,985
Methamphetamine	15,088	35.0	4,744	-	25,432
MDMA (Ecstasy)	743	31.0	292	-	1,193
GHB	...	73.4	...	-	...
Flunitrazepam (Rohypnol)	...	0.0	...	-	...
Ketamine	...	28.5	...	-	...
LSD	226	48.2	12	-	440
PCP	531	41.1	104	-	959
Miscellaneous hallucinogens	118	39.4	27	-	209
Inhalants	...	73.1	...	-	...
Combinations not tabulated above (NTA)	112	17.5	74	-	151

¹ The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2005, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2006). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

³ Estimates are all expressed in visits. Visits cannot be summed across drugs because drug-related ED visits often involve multiple drugs.

⁴ Three dots (...) indicate that an estimate with an RSE greater than 50% or an estimate less than 30 has been suppressed.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).

Among the seeking detox ED visits, nearly 8 out of 10 (78%) received some type of follow-up care, either inpatient admission, referral elsewhere for detox or substance abuse treatment services, or transfer to another health care facility. However, almost one fifth (18%) of seeking detox cases may not have received the care they sought because they were discharged to home.

Table 20**Seeking detox, by patient and visit characteristics: 2005**

Patient characteristics	Estimated visits ^{1,2}	Visit characteristics	Estimated visits ^{1,2}
Total drug-related ED visits, seeking detox	174,141		
Gender		Number of drugs involved	
Male	110,482	Single drug	62,264
Female	63,619	Multiple drugs	111,877
Unknown	40		
Age		Disposition	
0-5 years	...	Treated and released	82,089
6-11 years	...	Discharged home	31,708
12-17 years	1,872	Released to police/jail	856
18-20 years	10,767	Referred to detox/treatment	49,525
21-24 years	22,318	Admitted to this hospital	...
25-29 years	29,171	ICU/critical care	587
30-34 years	25,349	Surgery	...
35-44 years	50,199	Chemical dependency/detox	...
45-54 years	28,498	Psychiatric unit	10,314
55-64 years	4,730	Other inpatient unit	4,519
65 years and older	...	Other disposition	17,787
Unknown	37	Transferred	11,595
Race/ethnicity		Left against medical advice	2,978
White	115,856	Died	...
Black	32,441	Other	1,212
Hispanic	10,287	Not documented	2,001
Race/ethnicity not tabulated above (NTA)	1,524		
Unknown	14,003		

¹ These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

² Three dots (...) indicate that an estimate with an RSE greater than 50% or an estimate less than 30 has been suppressed.

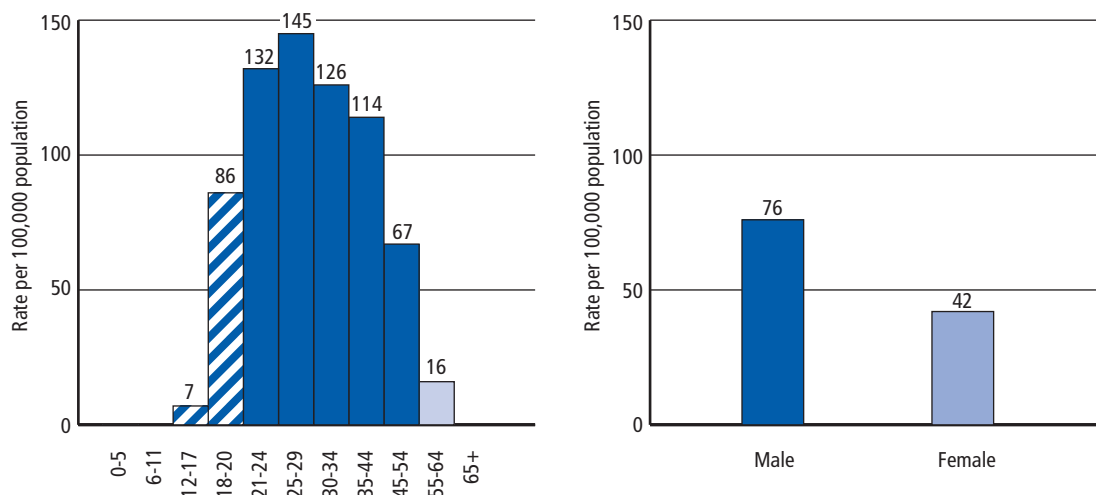
SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).

Taking population size and the margin of error into account, the rates of seeking detox visits were similar across all age groups in the 18 to 54 range. The rate of seeking detox visits for males was not significantly different than that for females. The lack of significant differences between age and gender subgroups is partially due to large margins of error.

In terms of race/ethnicity, the majority (67%) of seeking detox visits involved patients who were white. Evaluating the relative frequencies of the race/ethnicity groups is impeded by missing data; in 8% of visits race/ethnicity was unknown.

Figure 7

Seeking detox, ED visit rates by age and gender: 2005



SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).

Seeking detox ED visits: 2004 and 2005 (Table 21)

No changes in ED visits from 2004 to 2005 were detected for seeking detox ED visits overall or for alcohol or the illicit drugs involved in these visits (Table 21).

Table 21
Seeking detox: 2004 and 2005

Drug category and selected drugs ¹	Estimated visits ^{2,3}		Percent change 2004, 2005 ⁴
	2004	2005	
Total drug-related ED visits, seeking detox	177,879	174,141	
Alcohol	60,022	62,134	
Alcohol in combination	59,599	61,737	
Alcohol alone	424	397	
Cocaine	81,439	78,242	
Heroin	53,088	44,804	
Marijuana	27,259	24,801	
Stimulants	12,151	16,730	
Amphetamines	1,829	2,713	
Methamphetamine	10,518	15,088	
MDMA (Ecstasy)	908	743	
GHB	...	...
Flunitrazepam (Rohypnol)	...	...
Ketamine	...	...
LSD	60	226	
PCP	410	531	
Miscellaneous hallucinogens	90	118	
Inhalants	...	...
Combinations not tabulated above (NTA)	222	112	

¹ The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2005, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2006). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

² These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

³ Three dots (...) indicate that an estimate with an RSE greater than 50% or an estimate less than 30 has been suppressed.

⁴ This column denotes statistically significant ($p < 0.05$) increases or decreases between estimates for the periods shown.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).

Appendices

APPENDIX A

MULTUM LEXICON END-USER LICENSE AGREEMENT

1. Introduction

A. This License Agreement (the "License") applies to the Multum Lexicon database (the "Database"). This License does not apply to any other products or services of Cerner Multum, Inc. ("Multum"). A "work based on the Database" means either the Database or any derivative work under copyright law; i.e., a work containing the Database or a substantial portion of it, either verbatim or with modifications. A translation of the Database is included without limitation in the term "modification". Each end-user/licensee is addressed herein as "you".

B. Your use of the Database acknowledges acceptance of these restrictions, disclaimers, and limitations. You expressly acknowledge and agree that Multum is not responsible for the results of your decisions resulting from the use of the Database, including, but not limited to, your choosing to seek or not to seek professional medical care, or from choosing or not choosing specific treatment based on the Database.

C. Every effort has been made to ensure that the information provided in the Database is accurate, up-to-date, and complete, but no guarantee is made to that effect. In addition, the drug information contained herein may be time sensitive.

D. Multum does not assume any responsibility for any aspect of healthcare administered or not administered with the aid of information the Database provides.

2. Terms and Conditions for Copying, Distribution and Modification

A. You may copy and distribute verbatim copies of the Database as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and give any other recipients of the Database a copy of this License (the readme.txt file) along with the Database and anything else that is part of the package, which should be identified.

B. You may modify your copy or copies of the Database or any portion of it to form a derivative work, and copy and distribute such modifications or work under the terms of Section 2.A. above, provided that you also meet all of these conditions:

- i) You must cause the modified files to carry prominent notices stating that they are derived from the Multum Lexicon database from Cerner Multum, Inc. and that you changed the files and the date of any change(s).
- ii) If you incorporate modified files into a computer program, you must cause it, when started running for interactive use in the most ordinary way, to print or display an announcement including an appropriate copyright notice, a notice that you have modified the Multum Lexicon database from Cerner Multum, Inc., and a notice that there is no warranty (or that you provide the warranty) and telling the user how to view a copy of this License.

C. It is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Database.

D. You may copy and distribute the Database (or a work based on it, under Section 2.B.) in an encoded form under the terms of Sections 2.A. and 2.B. above provided that you also do one of the following:

- i) Accompany it with the complete corresponding machine-readable plain text, which must be distributed under the terms of Sections 2.A and 2.B. above on a medium customarily used for software interchange; or,
- ii) Accompany it with a written offer to give any third party, for no charge, a complete machine-readable copy of the Database (and the entirety of your derivative work based on it, under Section 2.B.), to be distributed under the terms of Sections 2.A. and 2.B. above on a medium customarily used for software interchange.

E. You may not copy, modify, sublicense, or distribute the Database except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense or distribute the Database will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

F. You are not required to accept this License. However, nothing else grants you permission to copy, modify or distribute the Database or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by copying, modifying or distributing the Database (or any work based on the Database), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Database or works based on it.

G. Each time you redistribute the Database (or any work based on the Database), the recipient automatically receives a license from Multum to copy, distribute or modify the Database subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties to this License.

3. Disclaimer of Warranties; Limitation of Damages

A. BECAUSE THE DATABASE IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE PROGRAM OR DATA, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING. MULTUM AND/OR OTHER PARTIES PROVIDE THE DATABASE "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED, STATUTORY OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE DATABASE IS WITH YOU. SHOULD THE DATABASE PROVE DEFECTIVE, INCOMPLETE, OR INACCURATE, YOU ASSUME THE RESPONSIBILITY AND COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

B. IN NO EVENT (UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING) WILL MULTUM, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE DATABASE AS PERMITTED ABOVE, BE LIABLE FOR ANY SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR INDIRECT DAMAGES, INCLUDING DAMAGES FOR LOSS OF PROFITS, LOSS OF BUSINESS, OR DOWN TIME, EVEN IF MULTUM OR ANY OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

C. IN ADDITION, WITHOUT LIMITING THE FOREGOING, THE DATABASE HAS BEEN DESIGNED FOR USE IN THE UNITED STATES ONLY AND COVERS THE DRUG PRODUCTS USED IN PRACTICE IN THE UNITED STATES. MULTUM PROVIDES NO CLINICAL INFORMATION OR CHECKS FOR DRUGS NOT AVAILABLE FOR SALE IN THE UNITED STATES AND CLINICAL PRACTICE PATTERNS OUTSIDE THE UNITED STATES MAY DIFFER SUBSTANTIALLY FROM INFORMATION SUPPLIED BY THE DATABASE. MULTUM DOES NOT WARRANT THAT USES OUTSIDE THE UNITED STATES ARE APPROPRIATE.

D. You acknowledge that updates to the Database are at the sole discretion of Multum. Multum makes no representations or warranties whatsoever, express or implied, with respect to the compatibility of the Database, or future releases thereof, with any computer hardware or software, nor does Multum represent or warrant the continuity of the features or the facilities provided by or through the Database as between various releases thereof.

E. Any warranties expressly provided herein do not apply if: (i) the end-user alters, mishandles or improperly uses, stores or installs all, or any part, of the Database, (ii) the end-user uses, stores or installs the Database on a computer system which fails to meet the specifications provided by Multum, or (iii) the breach of warranty arises out of or in connection with acts or omissions of persons other than Multum.

4. Assumption of Risk, Disclaimer of Liability, Indemnity

A. THE END-USER ASSUMES ALL RISK FOR SELECTION AND USE OF THE DATABASE AND CONTENT PROVIDED THEREON. MULTUM SHALL NOT BE RESPONSIBLE FOR ANY ERRORS, MISSTATEMENTS, INACCURACIES OR OMISSIONS REGARDING CONTENT DELIVERED THROUGH THE DATABASE OR ANY DELAYS IN OR INTERRUPTIONS OF SUCH DELIVERY.

B. THE END-USER ACKNOWLEDGES THAT MULTUM: (A) HAS NO CONTROL OF OR RESPONSIBILITY FOR THE END-USER'S USE OF THE DATABASE OR CONTENT PROVIDED THEREON, (B) HAS NO KNOWLEDGE OF THE SPECIFIC OR UNIQUE CIRCUMSTANCES UNDER WHICH THE DATABASE OR CONTENT PROVIDED THEREON MAY BE USED BY THE END-USER, (C) UNDERTAKES NO OBLIGATION TO SUPPLEMENT OR UPDATE CONTENT OF THE DATABASE, AND (D) HAS NO LIABILITY TO ANY PERSON FOR ANY DATA OR INFORMATION INPUT ON THE DATABASE BY PERSONS OTHER THAN MULTUM.

C. MULTUM SHALL NOT BE LIABLE TO ANY PERSON (INCLUDING BUT NOT LIMITED TO THE END-USER AND PERSONS TREATED BY OR ON BEHALF OF THE END-USER) FOR, AND THE END-USER AGREES TO INDEMNIFY AND HOLD MULTUM HARMLESS FROM ANY CLAIMS, LAWSUITS, PROCEEDINGS, COSTS, ATTORNEYS' FEES, DAMAGES OR OTHER LOSSES (COLLECTIVELY, "LOSSES") ARISING OUT OF OR RELATING TO (A) THE END-USER'S USE OF THE DATABASE OR CONTENT PROVIDED THEREON OR ANY EQUIPMENT FURNISHED IN CONNECTION THEREWITH AND (B) ANY DATA OR INFORMATION INPUT ON THE DATABASE BY END-USER, IN ALL CASES INCLUDING BUT NOT LIMITED TO LOSSES FOR TORT, PERSONAL INJURY, MEDICAL MALPRACTICE OR PRODUCT LIABILITY.

5. Miscellaneous

A. You warrant that you have authority within the organization you identified during registration for the Database to enter into license agreements with other organizations including Multum.

B. You agree that Multum may identify you and/or your organization by name as a "licensee", "licensed user", or "licensing organization" of the Database or a "client" of Multum in Multum's external market communications. You also agree that Multum may issue, if it desires, a press release stating that you and/or your organization have licensed the Database.

C. If conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other obligations, then as a consequence you may not distribute the Database at all.

D. If any portion of this License is held invalid or unenforceable under any particular circumstance, the balance of this License is intended to apply and the License as a whole is intended to apply in other circumstances.

E. If the distribution and/or use of the Database is or becomes restricted in certain countries either by patents or by copyrighted interfaces, Multum may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.

Multum Lexicon ©2005

Cerner Multum, Inc.
Colorado Center Tower One
2000 South Colorado Boulevard
Suite 11000
Denver, Colorado 80222
Document revised November 30, 2000

Downloaded 9/1/2006 from: <http://www.multum.com/license.htm>
[Lexicon Registration](#)

APPENDIX B

GLOSSARY OF TERMS

This glossary defines terms used in data collection activities, analyses, and publications associated with the emergency department (ED) component of the Drug Abuse Warning Network (DAWN).

Accidental ingestion: This category of drug-related ED visits includes those involving the accidental use of a drug, for example, childhood drug poisonings and individuals who take the wrong medication by mistake.

Adverse reaction: This category of drug-related ED visits represents the consequences of using a prescription or over-the-counter (OTC) pharmaceutical for therapeutic purposes and includes visits related to adverse drug reactions, side effects, drug-drug interactions, and drug-alcohol interactions. Adverse reactions that involve a pharmaceutical with an illicit drug are exceptions that are excluded from this category.

Alcohol only (age less than 21): This category of drug-related ED visits includes those in which alcohol was the only drug involved and the patient was aged less than 21. Although alcohol is an illegal drug for minors, combining these cases with other cases involving illicit drugs tends to mask rather than highlight their importance for prevention and treatment efforts. Most instances of alcohol as the only drug in patients under age 21 are classified in the alcohol only (age < 21) case type. However, some are classified as suicide-attempt or seeking detox, case types that precede alcohol only (age < 21) in sequence.

Case description: A description of how the drug(s) was related to the patient's ED visit. The case description, in conjunction with other documentation in the ED medical record, is used to determine if the ED visit is reportable to DAWN. It is copied verbatim from the patient's chart when possible.

Case type: See **Type of case**.

Case type other: See **Drug misuse and abuse**.

Confidence interval (CI): An interval estimate, that is, a range of values around a point estimate that takes sampling error into account. Ninety-five percent is an accepted standard of confidence. Technically, a 95% CI means that, if repeated samples were drawn from the same population of hospitals using the same sampling and data collection procedures, the true population value would fall within the confidence interval 95% of the time. Practically, a 95% CI summarizes both the estimate and its margin of error in a straightforward way with a reasonable degree of confidence. Calculation of 95% CIs is discussed in Appendix D.

Diagnosis: The condition(s) for which the patient was treated as determined by the clinician after study.

Disposition: The location or facility to which an ED patient was referred, transferred, or released.

Treated and released includes three categories:

- *Discharged home*—"Home" is used as a broad category to mean discharged to the patient's residence. Home is generally used for people who live locally; however, for students at nearby universities, home means their university; for travelers who get sick on the road, it may mean their hotel or wherever they are staying, and so forth.
- *Released to police/jail*
- *Referred to detox/treatment*—The chart indicates that the patient was referred to a substance abuse treatment or detox program, facility, or provider.

Admitted to this hospital includes five categories of inpatient units:

- *ICU/critical care*
- *Surgery*
- *Chemical dependency/detox*
- *Psychiatric unit*
- *Other inpatient unit*—The inpatient unit was not specified or does not match one of the preceding units.

Other disposition includes five categories:

- *Transferred*—The patient was transferred to another health care facility.
- *Left against medical advice*—The patient left the treatment setting without a physician's approval.
- *Died*—The patient died after arriving in the ED but before being discharged, admitted, or transferred.
- *Other*—The discharge status is documented in the chart but does not fit into any of the preceding categories.
- *Not documented*—The discharge status was not documented in the medical chart.

Drug: A substance that was recorded in a DAWN case report. Substances accepted by DAWN include alcohol, illicit drugs, prescription and over-the-counter pharmaceuticals, dietary supplements, and nonpharmaceutical inhalants. Multiple substances ("drugs") can be reported for each DAWN case. Therefore, the total number of drugs exceeds the total number of DAWN cases reported. (See also **Single-drug case**.)

Drug category: A generic grouping of related pharmaceuticals or other substances reported to DAWN, based on the classification of Multum Information Services. Multum Information Services is a subsidiary of the Cerner Corporation and a developer of clinical drug information systems and a drug knowledge base. More information is available at <http://www.multum.com>. In general, the Multum categories follow the therapeutic uses for prescription and over-the-counter pharmaceuticals.

Additional clarification is provided for the following drug categories:

- *Alcohol alone*—DAWN collects data on alcohol when used alone only if the patient is under age 21.
- *Alcohol in combination*—The category for alcohol present with another reportable substance. DAWN does not gather data on alcohol used alone if the patient is aged 21 years or older. For patients 21 and older, alcohol must be used with another substance to be reported to DAWN. Alcohol in combination is reportable for all ages.
- *Amphetamines*—This class of substances has been extracted from the category of central nervous system (CNS) stimulants because of its importance as a major substance of abuse. For purposes of classification, "amphetamines" (plural) includes a class of compounds derived from or related to the drug amphetamine.

Although some “designer” drugs fall into the class of amphetamines, we choose to report some of them individually as major substances of abuse (e.g., methamphetamine). This category does not include other CNS stimulants, such as caffeine or methylphenidate.

- *Combinations not tabulated above (NTA)*—This category includes combinations composed of two or more major substances of abuse that are mixed and taken together. For example, “speedball,” which usually refers to the combination of heroin and cocaine taken at once, would be classified as a combination NTA, whereas heroin and cocaine used separately would be classified separately in the categories heroin and cocaine. Combinations consisting of a major substance of abuse and another substance are classified in the category of the major substance (e.g., heroin with scopolamine is classified as heroin).
- *Inhalants*—This category includes anesthetic gases and psychoactive nonpharmaceutical substances for which the documented route of administration was inhaling, sniffing, or snorting. Psychoactive nonpharmaceuticals fall into one of the following three categories: (1) **volatile solvents**—adhesives (model airplane glue, rubber cement, household glue), aerosols (spray paint, hairspray, air freshener, deodorant, fabric protector), solvents and gases (nail polish remover, paint thinner, correction fluid and thinner, toxic markers, pure toluene, cigar lighter fluid, gasoline, carburetor cleaner, octane booster), cleaning agents (dry cleaning fluid, spot remover, degreaser), food products (vegetable cooking spray, dessert topping spray such as whipped cream, whippets), and gases (butane, propane, helium); (2) **nitrites**—amyl nitrites (“poppers,” “snappers”) and butyl nitrites (“rush,” “locker room,” “bolt,” “climax,” “video head cleaner”); or (3) **chlorofluorohydrocarbons** (freons). Anesthetic gases (e.g., nitrous oxide, ether, chloroform) are presumed to have been inhaled.
- *Stimulants*—This category includes amphetamines and methamphetamine. Since some drug screens test for amphetamines only as a class, an amphetamine-positive result could indicate amphetamine or methamphetamine. For this reason, amphetamines and methamphetamine are combined for analysis into the category “stimulants.” This category does not include other CNS stimulants, such as caffeine or methylphenidate.

Drug misuse and abuse: A group of ED visits defined broadly to include all visits associated with illicit drugs, alcohol use in combination with illicit drugs or alcohol alone among those aged < 21 years, and nonmedical use of pharmaceuticals. Nonmedical use of pharmaceuticals includes prescription and OTC pharmaceuticals in ED visits that are of the following case types:

- *Overmedication*—This category was designed to capture nonmedical use, overuse, and misuse of prescription and OTC medications that are not documented as drug abuse in the medical chart.
- *Malicious poisoning*—This category was designed to capture cases of drug use in which the patient was administered a drug by another person for a malicious purpose. Drug-facilitated sexual assault is one type of malicious poisoning, but other types of malicious poisonings, such as product tampering, would be classified in this category as well.
- *Case type Other*—This category includes all drug-related ED visits that could not be assigned to any of the other seven types. By design, most cases of documented drug abuse will fall into this category.

Drug-related ED visit: Any ED visit related to recent drug use. This is the definition of a DAWN case effective January 1, 2003. To be a DAWN case, a drug needs only to be implicated in the visit; the drug does not have to have caused the visit. One patient may make repeated visits to an ED or to several EDs, thus producing a number of visits. The number of unique patients involved in the reported drug-related ED visits cannot be estimated, because no direct patient identifiers are collected by DAWN.

Estimate: A statistical estimate is the value of a parameter (such as the number of drug-related ED visits) for the universe that is derived by applying sampling weights to data from a sample.

Hospital emergency department (ED): Only hospitals that meet eligibility criteria for DAWN are recruited to participate. To be eligible, hospitals must be non-Federal, short-stay, general medical and surgical facilities that operate one or more emergency departments 24 hours a day, 7 days a week, and be located in the United States. Specialty hospitals, hospital units of institutions, long-term care facilities, pediatric hospitals, hospitals operating part-time EDs, and hospitals operated by the Veterans Health Administration and the Indian Health Service are excluded. The universe of emergency departments is identified from the American Hospital Association's Annual Survey Database. (See also **Universe**.)

Malicious poisoning: See **Drug misuse and abuse**.

Metropolitan area: An area comprising a relatively large core city or cities and the adjacent geographic areas. Conceptually, these areas are integrated economic and social units with a large population nucleus. This DAWN publication utilizes areas defined by the Office of Management and Budget (OMB) in 2003, based on population data from the 2000 decennial Census.

Not otherwise specified (NOS): The catch-all category for substances that are not specifically named. Terms are classified into an NOS category only when assignment to a more specific category is not possible based on information in the source documentation (ED patient charts).

Not tabulated above (NTA): The designation used when categories are not presented in complete detail; smaller units are combined in the NTA category.

Overmedication: See **Drug misuse and abuse**.

***p*-value:** A measure of the probability (*p*) that the difference between two estimates could have occurred by chance, if the estimates being compared were really the same. The larger the *p*-value, the more likely the difference could have occurred by chance. For example, if the difference between two DAWN estimates has a *p*-value of 0.01, it means that there is a 1% probability that the difference observed could be due to chance alone.

Population: See **Universe**.

Precision: The extent to which an estimate agrees with its mean value in repeated sampling. The precision of an estimate is measured inversely by its standard error (SE) or relative standard error (RSE). In DAWN publications, estimates with RSEs greater than 50% are regarded as too imprecise to be published. ED table cells where such estimates would have appeared contain the symbol "..." (3 dots). (See also **Relative standard error**.)

Race/ethnicity: According to the standard protocol issued by OMB in 1997, the race/ethnicity categories on the DAWN data collection forms are as follows:

- *White*—A person having origins in any of the original peoples of Europe, the Middle East, or North Africa.
- *Black or African American*—A person having origins in any of the black racial groups of Africa.
- *Hispanic or Latino*—A person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race.
- *Asian*—A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.
- *American Indian or Alaska Native*—A person having origins in any of the original peoples of North and South America (including Central America), and who maintains tribal affiliation or community attachment.
- *Native Hawaiian or Other Pacific Islander*—A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.
- *Not documented*—Used when documentation of race is not available from source records.

Despite the detail allowed by these categories, race and ethnicity are often not documented with this level of specificity in patient/decedent records. As a result, categories used to tabulate race and ethnicity data in the publications are:

- *White*—Anyone meeting the definition of white (above). Those who are identified as white and Hispanic are classified as Hispanic.
- *Black*—Anyone meeting the definition of black or African American (above). Those who are identified as black or African American and Hispanic are classified as Hispanic.
- *Hispanic*—Anyone whose ethnicity is Hispanic or Latino (above) is placed in the category Hispanic, regardless of race.
- *Race/ethnicity NTA*—This includes those categories that are too small to report independently, including the following: two or more races, American Indian or Alaska Native, Asian, and Native Hawaiian or Other Pacific Islander.
- *Unknown*—Race/ethnicity is unknown. Those who are identified only as Hispanic are classified as Hispanic.

Relative standard error (RSE): A measure of an estimate's relative precision. The RSE of an estimate is equal to the estimate's standard error (SE) divided by the estimate itself. For example, an estimate of 2,000 cocaine visits with an SE of 200 visits has an RSE of 10%. The larger the RSE, the less precise the estimate. Estimates with an RSE of 50% or greater are not published by DAWN. (See also **Precision** and **Standard error**.)

Sampling: Sampling is the process of selecting a proper subset of elements from the full population so that the subset can be used to make inference to the population as a whole. A probability sample is one in which each element has a known and positive chance (probability) of selection. A simple random sample is one in which each member has the same chance of selection. In DAWN, a sample of hospitals is selected in order to make inference to all hospitals; DAWN uses simple random sampling within strata.

Sampling frame: A list of units from which the ED sample is drawn. All members of the sampling frame have a probability of being selected. A sampling frame is constructed such that there is no duplication and each unit is identifiable. Ideally, the sampling frame and the universe are the same. The sampling frame for the DAWN hospital ED sample is derived from the American Hospital Association (AHA) Annual Survey Database.

Sampling unit: A member of a sample selected from a sampling frame. For the DAWN sample, the units are hospitals, and data are collected for all drug-related ED visits at the responding hospitals selected for the sample.

Sampling weights: Numeric coefficients used to derive population estimates from a sample.

Seeking detox: This category of drug-related ED visits captures patients seeking substance abuse treatment, drug rehabilitation, or medical clearance for admission to a drug treatment or detoxification unit. They are classified separately because they often reflect administrative practices that vary across hospitals and may vary over time within the same hospital. Seeking detox visits tend to be concentrated in those facilities that operate specialized inpatient units providing substance abuse treatment or detoxification services, and the largest numbers are found in facilities that require medical clearance for entry into such treatment to be granted in their EDs.

Single-drug case: A single-drug case is one in which only one drug was involved. Because multiple substances may be recorded for each DAWN case (see **Drug**), readers should be cautious in interpreting the relationship between a given drug and the number of associated visits or deaths. For example, if the source record for a patient/decedent documented marijuana use, this does not mean that marijuana was the only drug involved in the visit/death or that the marijuana caused the visit/death. One should always consider whether and how many other drugs were used in combination. Even then, attributing a causal relationship between the visit/death and a particular drug may not be possible. DAWN captures single-drug visits/deaths involving alcohol only if the patient /decedent was younger than age 21.

Standard error (SE): A measure of the sampling variability or precision of an estimate. The SE of an estimate is expressed in the same units as the estimate itself. For example, an estimate of 10,000 visits with an SE of 500 indicates that the SE is 500 visits.

Statistically significant: A difference between two estimates is said to be statistically significant if the value of the statistic used to test the difference is larger or smaller than would be expected by chance alone. For DAWN ED estimates, a difference is considered statistically significant if the *p*-value is less than 0.05. (See also ***p*-value**.)

Strata (plural), stratum (singular): Subgroups of a universe within which separate ED samples are drawn. Stratification is used to increase the precision of estimates for a given sample size, or, conversely, to reduce the sample size required to achieve the desired level of precision. The DAWN ED sample is stratified into metropolitan area cells plus an additional cell for the remainder of the United States. To ensure thorough coverage within metropolitan areas, the universe of hospitals in each is allocated into substrata identified by (a) two types of hospital ownership (public, private) and (b) up to four size categories (measured in terms of annual ED visits), creating up to eight substrata in each metropolitan area stratum. Hospitals in the stratum that covers the rest of the United States are stratified first by Census region, and then by state, type of ownership, and size (also measured in terms of ED visits). A systematic sample is selected from each of the geographic strata.

Suicide attempt: This category of drug-related ED visits captures suicide attempts (e.g., “attempted suicide,” “tried to kill self”) documented in the medical record in which a drug was involved. Suicidal gestures, thoughts, or ideation, including attempts to “harm” self, are assigned to another case type.

Type of case: A classification used to group similar DAWN cases from the diverse set of all drug-related ED visits. Each case is coded into one and only one category, the first that applies from the following hierarchy: suicide attempt, seeking detox, alcohol only (age < 21), adverse reaction, overmedication, malicious poisoning, accidental ingestion, and other. The rules for assignment of DAWN cases to types of cases are defined in the DAWN ED Decision Tree.

Universe: The entire set of units for which generalizations are drawn. The universe for the DAWN ED sample is all non-Federal, short-stay, general medical and surgical hospitals in the United States that operate one or more emergency departments 24 hours a day, 7 days a week. Specialty hospitals, hospital units of institutions, long-term care facilities, pediatric hospitals, hospitals operating part-time EDs, and hospitals operated by the Veterans Health Administration and the Indian Health Services are excluded. The universe of EDs is identified from the American Hospital Association’s Annual Survey Database.

APPENDIX C

DAWN DATA COLLECTION AND ANALYTIC METHODS

DAWN data collection

DAWN emergency department (ED) data are collected in EDs through a retrospective review of ED medical records for every patient treated in the ED. Patients or families are never interviewed. The review of source records is performed by a trained DAWN Reporter in each member facility. Depending on the needs of the facility, the DAWN Reporter may be an employee of the hospital or an employee of the DAWN operations contractor.

Within each facility that participates in DAWN, the designated DAWN Reporter reviews all medical records to identify ED visits related to drug use. The DAWN Reporter submits an electronic case report to the DAWN system for each ED visit that meets the specific case selection criteria. DAWN Reporters also track, on a copy of the ED registration log, their progress in reviewing the universe of ED visits.

Data items collected by DAWN

The case report form showing all the collected DAWN data items is provided in Figure C1.

ED visits eligible for DAWN

A DAWN case is any ED visit related to recent drug use. DAWN includes ED visits associated with substance abuse and misuse, both intentional and accidental. DAWN also includes ED visits related to the use of drugs for legitimate therapeutic purposes. To be a DAWN case, the relation between the ED visit and the drug need not be causal; the drug needs only to be implicated in the visit.

The case criteria are intended to be broad and inclusive, and to have few exceptions. Broad criteria take into account the fact that documentation in medical records varies in clarity and comprehensiveness across hospitals and among clinicians within hospitals. Broad criteria minimize the potential for judgments that could cause data to vary systematically and unexpectedly across reporters and hospitals. In addition, broad criteria are designed to capture a very diverse set of drug-related visits that can be aggregated or disaggregated to serve a variety of analytical purposes and the interests of multiple audiences. In DAWN, only recent drug use is included,¹ the reason a patient used a drug is irrelevant, and the criteria are broad enough to encompass all types of drug-related events, including, but not limited to, explicit drug abuse.

There are a few clearly delineated exceptions to the DAWN eligibility criteria. An ED visit is *not* a DAWN visit if:

- There is no evidence of recent drug use.
- The patient left the ED without being treated.
- The patient consumed a nonpharmaceutical substance but did not inhale it.
- The patient has a history of drug use but no recent use.
- Alcohol is the only substance involved and the patient is an adult (aged 21 or over).

¹ That is, patients with a history of drug use (and no recent use) are excluded.

Figure C1
DAWN ED case form

FOR SAMHSA USE ONLY
FORM NUMBER

Department of Health and Human Services • Substance Abuse and Mental Health Services Administration

Drug Abuse Warning Network (DAWN)
Emergency Department Case Form

FORM APPROVED
OMB NO. 0930-0078
EXPIRES 12/31/2005

1. Facility ID

--	--	--	--	--	--	--	--

2. Cross-reference
(for facility use only)

PATIENT INFORMATION

3. Date of Visit

MONTH	DAY	YEAR
		20

4. Time of Visit

HOUR	MINUTES	<input type="checkbox"/> a.m. <input type="checkbox"/> p.m. <input type="checkbox"/> military

5. Age

<div style="border: 1px solid black; width: 20px; height: 20px; margin: 0 auto;"></div>	<div style="border: 1px solid black; width: 20px; height: 20px; margin: 0 auto;"></div>	<input type="checkbox"/> Less than 1 year <input type="checkbox"/> Not documented
---	---	--

6. Patient's Home ZIP Code

--	--	--	--	--	--	--	--

Otherwise, mark [x] one response:

1 ☐ No fixed address (e.g., homeless)
 2 ☐ Institution (e.g., shelter/jail/hospital)
 8 ☐ Not documented

7. Sex

1 ☐ Male
 2 ☐ Female
 8 ☐ Not documented

8. Race/Ethnicity
Mark [x] one or more:

☐ White
☐ Black or African American
☐ Hispanic or Latino
☐ Asian
☐ American Indian or Alaska Native
☐ Native Hawaiian or Other Pacific Islander
☐ Not documented

9. Case Description *Describe how the drug(s) was related to the ED visit. Copy verbatim from the patient's chart when possible.*

10. Chief Complaint *Mark [x] all that apply:*

<input type="checkbox"/> Overdose	<input type="checkbox"/> Seeking detox
<input type="checkbox"/> Intoxication	<input type="checkbox"/> Accident/injury/assault
<input type="checkbox"/> Seizures	<input type="checkbox"/> Abscess/cellulitis/skin/tissue
<input type="checkbox"/> Altered mental status	<input type="checkbox"/> Chest pain
<input type="checkbox"/> Psychiatric condition	<input type="checkbox"/> Respiratory problems
<input type="checkbox"/> Withdrawal	<input type="checkbox"/> Digestive problems
<input type="checkbox"/> Other (specify): _____	

11. Substance(s) Involved *Using available documentation, list all substances that caused or contributed to the ED visit. Record substances as specifically as possible (i.e., brand [trade] name preferred over generic name preferred over chemical name, etc.). Do not record the same substance by two different names.*

SAMHSA USE ONLY	Substance (record verbatim)	Mark [x] if confirmed by toxicology test	Route of Administration <i>Circle one:</i>					
			Oral	Injected	Inhaled, sniffl'd, smoked	Other	Not documented	
1		<input type="checkbox"/>	1	2	3	4	5	8
2		<input type="checkbox"/>	1	2	3	4	5	8
3		<input type="checkbox"/>	1	2	3	4	5	8
4		<input type="checkbox"/>	1	2	3	4	5	8
5		<input type="checkbox"/>	1	2	3	4	5	8
6		<input type="checkbox"/>	1	2	3	4	5	8
7	C 2 0 0 0 2 9 Alcohol involved? 1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No 8 <input type="checkbox"/> Not documented	<input type="checkbox"/>	1	2	3	4	5	8

12. Type of Case
Mark [x] the first category that applies:

01 ☐ Suicide attempt
 02 ☐ Seeking detox
 03 ☐ Alcohol only (age < 21)
 04 ☐ Adverse reaction
 05 ☐ Overmedication
 06 ☐ Malicious poisoning
 07 ☐ Accidental ingestion
 08 ☐ Other

13. Diagnosis *List up to 4 diagnoses noted in the patient's chart. Do not list ICD codes.*

1 _____	3 _____
2 _____	4 _____

14. Disposition *Mark [x] one:*

<i>Treated and released:</i> 01 <input type="checkbox"/> Discharged home 02 <input type="checkbox"/> Released to police/jail 03 <input type="checkbox"/> Referred to detox/treatment	<i>Admitted to this hospital:</i> 04 <input type="checkbox"/> ICU/Critical care 05 <input type="checkbox"/> Surgery 06 <input type="checkbox"/> Chemical dependency/detox 07 <input type="checkbox"/> Psychiatric unit 08 <input type="checkbox"/> Other inpatient unit	<i>Other disposition:</i> 09 <input type="checkbox"/> Transferred 10 <input type="checkbox"/> Left against medical advice 11 <input type="checkbox"/> Died 96 <input type="checkbox"/> Other 98 <input type="checkbox"/> Not documented
---	--	--

- The only documentation of a drug is in toxicology test results.
- The only drugs listed (e.g., current medications) are not related to the visit.
- The patient is being treated as a consequence of undermedication (i.e., taking too little of a drug).

Types of cases in DAWN

By design, DAWN's broad case criteria yield a diverse set of visits. To bring order to this heterogeneous mix of ED visits, each visit is assigned to one of eight types, which may be analyzed separately or in purposeful combinations. The eight types of visits are:

- Suicide attempt,
- Seeking detoxification,
- Alcohol only in patients under age 21,
- Adverse reaction,
- Overmedication,
- Malicious poisoning (including drug-facilitated sexual assault or product tampering),
- Accidental ingestion, and
- *Other*.

DAWN Reporters assign each DAWN case to one, and only one, of the eight case types, based on a series of questions and decision rules. The questions and rules are organized as a decision tree (Figure C2). Starting at the top, each case is assigned to the first case type that applies, even if the case might also meet the rules for a subsequent category. The eight case types were ordered with this in mind.

The final category in the decision tree is called *Other* and it is reserved for DAWN visits that do not meet any of the rules for classification into one of the first seven types. By design, most cases of drug abuse are classified as case type *Other*. This approach, which never directly identifies drug abuse, comes from the recognition that medical records frequently lack explicit documentation of substance abuse. This lack of documentation may occur for several reasons. First, the distinctions among use, misuse, and abuse are often subjective. Second, if there is a low index of suspicion for drug abuse in some types of patients, ED physicians may be unlikely to label those types of patients as drug abusers. Third, in many States, insurers may legally deny payment for ED visits related to substance abuse. Thus, financial incentives may be a powerful factor to influence documentation practices.

Drugs included in DAWN

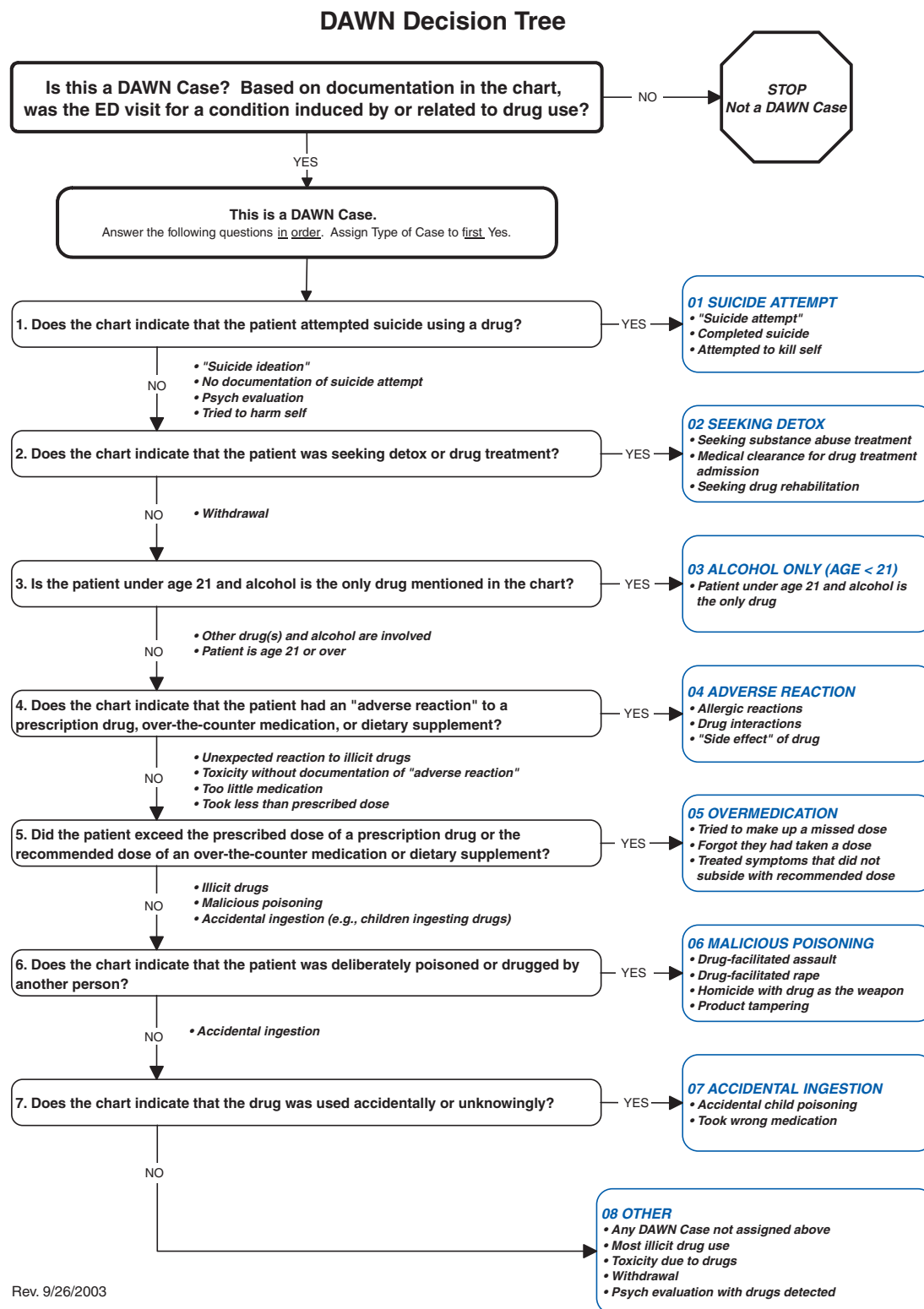
DAWN includes all types of drugs:²

- Illegal drugs, such as heroin, cocaine, marijuana, and Ecstasy,
- Prescription drugs, such as Prozac®, Vicodin®, OxyContin®, alprazolam, and methylphenidate,
- Over-the-counter (OTC) medications, including aspirin, acetaminophen, ibuprofen, and multi-ingredient cough and cold remedies,
- Dietary supplements, including vitamins, herbal remedies, and nutritional products,

² The classification of drugs used in DAWN is derived from the Multum *Lexicon*, © 2005, Multum Information Services, Inc. The classification was modified to meet DAWN's unique requirements (2006). The Multum Licensing Agreement governing use of the *Lexicon* is provided in Appendix A and can be found on the Internet at <http://www.multum.com>.

Figure C2

Type of case decision tree



- Psychoactive, nonpharmaceutical inhalants,
- Alcohol in combination with other drugs, and
- Alcohol alone, in patients aged less than 21 years.

To be reportable, a nonpharmaceutical substance must be consumed by inhalation, sniffing, or snorting, and it must have a psychoactive effect when inhaled. An ED visit involving inhalation of a nonpharmaceutical, psychoactive substance and no other drug qualifies as a DAWN case. Carbon monoxide is excluded from the inhalants. Beginning in 2004, cases involving accidental exposures (e.g., exposure to paint fumes while one is painting a closet) are excluded as well.

DAWN features that enhance data quality and reliability

Several methods are used to improve the quality and reliability of DAWN data, including the following:

- Retrospective review of ED medical records for every patient treated in participating EDs,
- Electronic reporting with automated prompts and data validation,
- Inclusion of data items on the health effects of drug use and additional detail on patient disposition,
- Elimination of incidental drug reporting,
- Accurate, specific, and nonredundant drug reporting,
- Inclusion of data items to identify drugs confirmed by laboratory testing,
- Rigorous training and certification of DAWN Reporters, and
- In-house review and cleaning of DAWN case reports.

DAWN data in this publication

For analysis, we defined three categories of ED visits related to drug misuse and abuse. These categories, designed to parallel the approach of the National Survey on Drug Use and Health, are based on:

- Use of illicit drugs,
- Use of alcohol, in combination with other drugs, and alcohol alone in patients under the age of 21, and
- Nonmedical use of pharmaceuticals (e.g., prescription or OTC drugs).

These three categories are defined by drug and case type as shown in Table C1. Because multiple drugs may be involved in a single visit, these categories are not mutually exclusive.

Hospital participation in 2005 and 2004

For 2005, 355 hospitals submitted data that were used for estimation (Table C2). The overall weighted response rate was 43.2%. For the 10 oversampled metropolitan areas and divisions, individual response rates ranged from 59.0% in the New Orleans area to 78.5% in the Detroit area.

For 2004, 417 hospitals submitted data that were used for estimation. The overall weighted response rate in 2004 was 47.6%.

Table C1**ED visits related to drug misuse and abuse in DAWN**

Type of drug involvement	Drugs included	Case types included
Use of illicit drugs	<ul style="list-style-type: none"> – Cocaine – Heroin – Marijuana – Stimulants (amphetamines and methamphetamine) – MDMA – GHB – Flunitrazepam (Rohypnol) – Ketamine – LSD – PCP – Other hallucinogens – Nonpharmaceutical inhalants – Combinations of illicit drugs 	All case types
Use of alcohol	<ul style="list-style-type: none"> – Alcohol in combination with other drug(s) – Alcohol only in patients under the age of 21 	<p>All case types, regardless of age</p> <p>Cases with alcohol as the sole drug appear only in the following case types for patients under age 21:</p> <ul style="list-style-type: none"> – Suicide attempts – Seeking detox – Alcohol only (age < 21)
Nonmedical use of pharmaceuticals	<ul style="list-style-type: none"> – Prescription and OTC pharmaceuticals – Dietary supplements 	<p>Combination of three case types:</p> <ul style="list-style-type: none"> – Overmedication (cases of nonmedical use, overuse, misuse lacking explicit documentation of drug abuse) – Malicious poisoning (cases in which the patient was administered a drug by another for a malicious purpose) – Case type Other (cases that could not be assigned to another case type; includes documented drug abuse)

NOTE: In this publication the case types of suicide attempt and seeking detox are analyzed separately, but for other purposes they might be considered as nonmedical use. Nonmedical use, though, should never include adverse reaction or accidental ingestion cases.

Table C2**DAWN ED sample and response rates: 2005**

Geographic area	Total eligible hospitals ¹	Eligible hospitals in sample	Responding hospitals in sample	Response rate for sample hospitals	Response rate for visits (weighted)
Total U.S.²	4,447	913	355	38.9%	43.2%
Metropolitan Statistical Areas (MSAs)³					
Boston-Cambridge-Quincy, MA-NH MSA	40	29	19	65.5%	71.6%
Denver-Aurora, CO MSA	15	14	7	50.0%	61.0%
Detroit-Warren-Livonia, MI MSA	35	23	18	78.3%	78.5%
New Orleans-Metairie-Kenner, LA MSA ⁴	21	21	10	47.6%	59.0%
Phoenix-Mesa-Scottsdale, AZ MSA	27	25	14	56.0%	60.5%
San Diego-Carlsbad-San Marcos, CA MSA	16	16	10	62.5%	66.1%
Seattle-Tacoma-Bellevue, WA MSA	22	22	11	50.0%	60.9%
Metropolitan Divisions and Subareas³					
Miami-Miami Beach-Kendall, FL, Metropolitan Division of Miami-Fort Lauderdale-Miami Beach, FL MSA	21	16	10	62.5%	62.1%
Bronx, Kings, New York, Queens, Richmond Counties of New York-Newark-Edison, NY-NJ-PA MSA	50	39	24	61.5%	67.4%
San Francisco-San Mateo-Redwood City, CA Metropolitan Division of San Francisco-Oakland-Fremont, CA MSA	18	18	9	50.0%	67.7%

¹ Short-term, general, non-Federal hospitals with 24-hour emergency departments, based on the American Hospital Association (AHA) Annual Survey, are eligible for DAWN.

² Total eligible hospitals in the U.S. include eligible hospitals from metropolitan areas shown and the remainder of the U.S. Therefore, components shown do not sum to the total.

³ Metropolitan Statistical Areas (MSAs) and Metropolitan Divisions follow the standard definitions issued by the Office of Management and Budget in June 2003 (available at <http://www.whitehouse.gov/omb/bulletins/b03-04.html>), with one exception: For New York, geographic coverage is limited to the subarea comprising the five Boroughs of New York City.

⁴ Response rates shown are for New Orleans before Hurricane Katrina and its aftermath.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).

Charts reviewed for drug-related ED visits in 2005 and 2004

As noted above, DAWN cases are found through a retrospective review of medical records in participating hospitals. In 2005, more than 11.8 million ED charts were reviewed to determine if the visits met the DAWN case criteria. For 2005, 364,012 drug-related visits were found among the medical records of 355 participating hospitals (Table C3). On average, participating hospitals submitted 1,025 DAWN cases. The number of cases submitted varied widely across hospitals, ranging from 1 case to 9,012 cases (median 640) in a single hospital. Over 5 million drugs were reported for these ED visits; on average in 2005, a drug-related ED visit involved 1.6 drugs.

Across the 417 participating hospitals in 2004, more than 12 million charts were reviewed to find the drug-related visits that met the DAWN case criteria. Based on the review of charts, 279,564 drug-related visits were found and submitted. On average, a DAWN member hospital submitted 670 DAWN cases. However, the number of cases varied widely, from 4 cases to 7,485 (median 402) in a single hospital. About 4.5 million drugs were reported for these ED visits; on average, a drug-related ED visit in 2004 also involved 1.6 drugs.

Table C3

Drug-related ED visits, by type of case: 2005

Type of case	Unweighted sample data	Weighted estimates ¹	Relative standard error (RSE)	95% Confidence interval		
				Lower bound	-	Upper bound
Drug-related ED visits						
Suicide attempt	16,339	132,582	7.4	113,283	-	151,882
Seeking detox	29,989	174,141	33.6	59,348	-	288,933
Alcohol only (age < 21)	12,582	96,933	9.4	79,086	-	114,780
Adverse reaction	120,034	1,052,384	10.6	832,781	-	1,271,987
Overmedication	31,696	274,181	9.9	221,114	-	327,248
Malicious poisoning	897	6,427	16.1	4,404	-	8,450
Accidental ingestion	5,266	51,501	8.5	42,957	-	60,044
Other	147,209	867,463	10.0	697,073	-	1,037,852
Total drug-related ED visits	364,012	2,655,612	7.9	2,242,511	-	3,068,713
Total ED visits (all reasons)	14,263,551	108,373,604	0.0	-		
Drugs ²						
Suicide attempt	34,891	291,225	7.1	250,437	-	332,013
Seeking detox	61,540	360,804	34.2	118,802	-	602,807
Alcohol only (age < 21)	12,582	96,933	9.4	79,086	-	114,780
Adverse reaction	150,705	1,326,747	11.3	1,033,757	-	1,619,738
Overmedication	54,505	490,905	10.1	393,851	-	587,959
Malicious poisoning	1,591	11,483	15.4	8,028	-	14,939
Accidental ingestion	6,784	67,475	8.4	56,431	-	78,519
Other	251,168	1,524,071	8.9	1,257,314	-	1,790,829
Drugs in all drug-related ED visits	573,766	4,169,644	7.7	3,539,075	-	4,800,214

¹ These are estimates based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

² These are estimates of drugs. A single ED visit may involve multiple drugs.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).

APPENDIX D

DAWN SAMPLING AND ESTIMATION METHODOLOGY

Introduction

The Drug Abuse Warning Network (DAWN) is a public health surveillance system that has monitored drug-related emergency department (ED) visits to hospitals since the early 1970s. DAWN was initially established by the Drug Enforcement Administration. Then DAWN was transferred to the U.S. Department of Health and Human Services (USDHHS), where the National Institute on Drug Abuse conducted DAWN from 1980 to 1992. Since 1992, the Office of Applied Studies (OAS) of the Substance Abuse and Mental Health Services Administration (SAMHSA), USDHHS, has been responsible for DAWN operations and reporting.

Since its inception, DAWN has relied on data collected from a sample of hospitals. However, over the years, the exact survey methodology has been adjusted to improve the quality, reliability, and generalizability of the information produced by DAWN. When the National Institute on Drug Abuse assumed responsibility for DAWN in 1980, implementation of a sample of hospitals to produce representative estimates for the Nation and for selected metropolitan areas became a priority. This sample, refreshed with annual maintenance, continued to support DAWN estimates for the coterminous United States and 21 metropolitan areas until 2002. By that time, major population shifts and changes in the hospital industry over the preceding two decades made apparent the need for a redesign of the sample of hospitals, which was undertaken as part of a wholesale redesign of most major features of DAWN.

Currently, the DAWN survey relies on a longitudinal probability sample of hospitals located throughout the United States, including Alaska and Hawaii. Hospitals eligible for selection into the DAWN sample must be non-Federal, short-stay, general surgical and medical hospitals located in the United States, with at least one 24-hour ED. This current approach was implemented in the 2004 data collection year, and this publication is the second to include estimates based on this sample design.

DAWN uses the data from the visits classified as DAWN cases in the selected hospitals to calculate various estimates of drug-related visits for the Nation as a whole, as well as for specific metropolitan areas. To calculate these estimates and measure their precision, the DAWN survey requires the application of sampling and weighting methodologies. This appendix documents the sampling, weighting, and variance estimation methodologies used to develop estimates for the data collected for 2005.

Target population

The target population is drug-related ED visits in non-Federal, short-stay, general surgical and medical hospitals in the United States with at least one 24-hour ED.

Sampling frame

DAWN uses the American Hospital Association (AHA) Annual Survey Database as the basis for its sampling frame. The AHA maintains an updated national registry of U.S. hospitals that is estimated to have a coverage rate of 99%.¹ A health care organization must meet several criteria to be classified as a hospital. These include the provision of patient services, diagnostic or therapeutic, for general or specific medical conditions; licensed medical staff; and accreditation by organizations such as the Joint Commission on Accreditation of Health Care Organizations. A hospital is considered to be eligible for inclusion in the DAWN sampling frame if it is a non-Federal, short-stay, general surgical and medical hospital in the United States, with at least one 24-hour ED. Many DAWN hospitals operate multiple EDs.

Sample maintenance

DAWN is a longitudinal survey that will be used to analyze trends in drug-related ED visits. In order to keep the frame representative of the current population of hospitals, annual updates must be performed. The initial sample was selected in 2003 from a sampling frame created from the 2001 AHA Annual Survey Database. In every subsequent year, the sampling frame is updated to reflect new, closed, merged, and demerged hospitals, based on updates to the AHA files. These updates include newly eligible hospitals, which are those new hospitals or previously ineligible hospitals that are now eligible. Each year, the newly eligible hospitals are provided the opportunity to be selected into the sample, based on the sampling fraction of the stratum in which the newly eligible hospital is located.

Determination of DAWN eligibility

A hospital is considered ineligible if any one of the key criteria that defines eligibility is not met. Only those hospitals that meet all the criteria are considered eligible. For hospitals where critical eligibility data are missing from the AHA database, if one of the nonmissing criteria is not met, the hospital is considered ineligible. Otherwise, the hospital is considered to have unknown eligibility. For any hospital with unknown eligibility, other variables in the AHA Annual Survey Database are used to determine eligibility. If the hospital's eligibility remains unknown after exploration of these additional characteristics, then the hospital may be contacted directly to determine eligibility.

Stratification

DAWN employs a stratified simple random sampling approach to select a representative sample of hospitals for inclusion in the DAWN sample. It is important that DAWN produce reliable estimates for major metropolitan areas, as well as for the Nation. Therefore, the first level of stratification is based on geography. There are two geographic stratification schemes: one for specified Metropolitan Statistical Areas² and subdivisions, and one for the remainder of the Nation. The second level of stratification is based on ownership and hospital size.

¹ AHA Annual Survey Database, Fiscal Year 2001 Health Forum LLC, Copyright 2003, One North Franklin Street, Chicago, IL 60606.

² Metropolitan Statistical Area is one category of Core Based Statistical Area (CBSA). The other CBSA category is the Micropolitan Statistical Area.

Metropolitan Statistical Areas and subdivisions

In order to accommodate a planned expansion of the metropolitan areas covered by DAWN, a maximum set of metropolitan areas, based on the definitions issued by the Office of Management and Budget (OMB) in June 2003, was selected. Which metropolitan areas to include was a topic of the DAWN redesign.³ Retention of the existing 21 metropolitan areas was important because there was significant demand for estimates for those areas, and addition of the 5 most populous metropolitan areas in each of the nine Census divisions was deemed important to improve DAWN's geographic and population coverage. This yielded a total of 48 metropolitan areas. For many of the 48 metropolitan areas, the June 2003 definitions resulted in larger metropolitan areas. In some cases, these larger areas represented a merger of previously separate metropolitan areas. However, there continued to be strong interest among users of DAWN statistics in the areas covered by the original 21 metropolitan areas. In order to address the needs of these users, four of the merged areas were subdivided. For each of these areas, there was a sample for the metropolitan area, as well as a sample for each subdivision. This would enable DAWN to produce estimates for the metropolitan areas and for the subdivisions. As a result of this process, the final metropolitan-area sample included a total of 53 geographic units: 48 metropolitan areas, 2 subdivisions each for 3 of these metropolitan areas, and 3 subdivisions for one of these metropolitan areas.

This design recognized that, although each of the 53 geographic units was sampled, not every geographic unit would be active in DAWN at any particular point in time.⁴ One more feature of the design was needed to preserve this flexibility. When any geographic unit was inactive, it had to be represented in the national estimate and, consequently, in the supplemental sample. Therefore, within each metropolitan area, hospitals were also sampled to serve as that metropolitan area's contribution to the supplemental sample.

Supplemental sample

The sample for the remainder of the Nation is referred to as the "supplemental sample" because it is designed to supplement the samples from the metropolitan areas to yield a national sample. The supplemental sample is, in effect, the 54th geographic unit for DAWN and is essential to achieve full coverage of the United States. The supplemental sample was formed by first dividing the United States into four Census regions. At any point in time, the supplemental sample provides coverage for all areas outside the 53 metropolitan units described above, plus sample representation for the metropolitan areas where DAWN is not active.

Stratification by ownership and size

Within the geographic stratification scheme described above, hospitals were further stratified by ownership (public or private) and by size (based on the total number of ED visits reported for the hospital in the AHA Annual Survey Database). To begin, a cross classification was created by categories of ownership status and geographic unit. Within each combination of geographic area and ownership status, the number of hospitals determined the number of unique size categories. If there were three or fewer hospitals, only one size category was defined. If there were four, five, six, or seven hospitals, two size categories were defined. If there were eight or more hospitals,

³ Substance Abuse and Mental Health Services Administration, Office of Applied Studies. *Drug Abuse Warning Network: Development of a New Design (Methodology Report)*. DAWN Series M-4, DHHS Publication No. (SMA) 02-3754, Rockville, MD, 2002.

⁴ This design took into account that expansion into additional metropolitan areas would occur over a period of time, but it has been similarly useful for contraction.

four size categories were defined. In the supplemental sample, within each combination of Census region and ownership, there were three size categories. This produced 24 unique strata from which to draw the hospitals for the supplemental sample.⁵

Target levels of precision

DAWN defines precision in terms of the relative standard error (RSE) of an estimate. The RSE is the standard error of the estimate divided by the actual point estimate. DAWN is designed to have RSEs less than or equal to 10% for metropolitan-area estimates, and RSEs less than or equal to 15% for national estimates pertaining to total drug-related visits, cocaine visits, heroin visits, and marijuana visits. As discussed below, these desired precision levels are important drivers for setting sample size targets.

Sample size and sample allocation

Sample sizes for each geographic area were determined by the area's targeted precision level in combination with the theory of optimal allocation for stratified samples. According to this approach, the variance of the sample estimates will be minimized when the sample size, n_h , in each sampling stratum is made proportional to the quantity $W_h S_h / C_h$, where W_h is the proportion of sampling units, S_h is the population standard deviation for the parameter being measured, and C_h represents the square root of the cost of sampling in stratum h .

Using these optimum allocation conditions, the minimum required sample sizes necessary to achieve the targeted levels of precision in each DAWN area were calculated using the following general considerations:

- Geographic units for which estimates are desired (national and metropolitan areas described under Stratification),
- Precision level desired (see Target levels of precision),
- Specific types of estimates for which minimum precision is desired (e.g., estimates of total, cocaine, heroin, and marijuana ED visits), and
- Cost.

In addition to these considerations, sampling rates (i.e., the number of sampled hospitals divided by the number of eligible hospitals) were also subject to the following constraints:

- First, if fewer than four hospitals existed in the stratum population, then all hospitals in the stratum were selected into the sample.
- Second, if the sampling rate for a particular stratum was greater than 90%, then all units in the stratum were selected into the sample.
- Finally, if any calculations produced a sample size smaller than two hospitals, then the sample size was set to two hospitals.

Reduction of bias

Survey error is the extent to which findings from the survey sample differ from those of the population of interest. The statistical methodologies described above are designed to minimize error. There are additional sources

⁵ Four Census regions times two ownership categories times three size categories equals 24 strata.

of error, often referred to as “bias,” that also contribute to overall error. Measuring bias is difficult because it requires accurate knowledge about corresponding population values. The DAWN survey methodology includes proven techniques, practices, and protocols that reduce the potential for introducing bias. For example, clearly defined criteria are used to construct the initial hospital sampling frame. Coverage bias is minimized, because the sampling frame has virtually 100% coverage of the target population. To minimize measurement bias, the individuals who collect data for DAWN are provided with specialized and intensive training; automated methods for data entry are used; and the data are subject to quality reviews at several points in the data collection process. Additional detail on the survey methodologies used to enhance DAWN data quality and reduce bias is provided in an earlier DAWN publication.⁶

Sampling weights

As discussed above, the DAWN hospitals were selected using stratified simple random sampling with oversampling in the selected metropolitan areas. The strata sample sizes were determined through the optimum allocation process. Sampling weights are calculated as the inverse of the probability of selection. Then the sampling weights are adjusted for nonresponse and by a procedure known as “poststratification,” or benchmark adjustment.

Weighting adjustment for nonresponse

Unit nonresponse occurs when hospitals fail to provide data or provide only incomplete data. To minimize the impact of unit nonresponse, the DAWN weighting plan includes nonresponse adjustment factors that were developed and applied within each weighting class. Weighting classes were formed based on the aforementioned sampling stratification schemes. Within each weighting class, the nonresponse adjustment factor was calculated as the sum of the sampled hospital weights divided by the sum of the weights of the responding hospitals. The nonresponse adjustment factors were checked to make sure the adjustments were within reasonable bounds. If a nonresponse adjustment factor was out of bounds (either too small or too large), adjacent weighting classes were collapsed and new nonresponse adjustment factors were calculated.

When the nonresponse adjustment factors were considered final, a nonresponse-adjusted sampling weight was then calculated. For responding hospitals, the nonresponse-adjusted sampling weight was calculated as the product of the nonresponse adjustment factor and the sampling weight. For nonresponding hospitals, the hospital nonresponse-adjusted sampling weight was set to zero. For each weighting class, a verification check was conducted to ensure that the sum of the nonresponse-adjusted sampling weights was equal to the sum of the sampled hospital weights.

Weighting adjustment for population benchmarks (poststratification)

The DAWN weighting plan also includes a poststratification adjustment factor that reconciles the weighted number of total visits for responding hospitals with the number of total visits from the most recent AHA Annual Survey Database. DAWN used a ratio adjustment within strata to implement this adjustment.

⁶ See Appendix B, Technical Notes: Changes to Improve the Quality of DAWN Data in: Substance Abuse and Mental Health Services Administration, Office of Applied Studies. *Drug Abuse Warning Network 2003: Interim National Estimates of Drug-Related Emergency Department Visits*. DAWN Series D-26, DHHS Publication No. (SMA) 04-3972, Rockville, MD, 2004.

Poststratification strata were formed based on the aforementioned sampling stratification schemes. Within each stratum, the adjustment factor was calculated as the ratio of the AHA count of total visits to the weighted sum of total visits for responding hospitals. The factors were verified to ensure they were within reasonable bounds. If they were out of bounds (either too small or too large), adjacent poststratification strata were collapsed and new poststratification adjustment factors were calculated.

When the poststratification adjustment factors were considered final, a poststratified weight was then calculated. The poststratified weight was calculated as the product of the poststratification adjustment factor and the nonresponse-adjusted sampling weight. For each poststratification stratum, a validity check was conducted to ensure that the sum of the poststratified weighted total visits was equal to the corresponding AHA count of total visits from each stratum.

Special consideration was given to New Orleans because Hurricane Katrina (on August 29, 2005) caused serious disruptions to the operations of hospitals and, consequently, the DAWN data collection process for the remaining four months of the year. Weight adjustments were implemented by referring to the AHA total counts in combination with a case-by-case study of each hospital in the New Orleans metropolitan area from the AHA file.⁷ Based on these studies, estimates were made of the proportion of the year that each hospital was open and serving the public. These were used to adjust the AHA totals, which in turn serve as input for population benchmark counts for New Orleans.

Total drug-related ED visits

Estimates for the entire universe of DAWN-eligible hospitals in the United States are produced by applying poststratified weights to the data received from the sampled hospitals. Thus, for 2005, 364,012 submitted cases were extrapolated to an estimate of 2,655,612 drug-related ED visits. Considering the margin of error, this estimate may range from 2,242,511 to 3,068,713 drug-related ED visits out of more than 108 million total ED visits estimated for the United States.

Calculation of estimates

All estimates produced for this publication were calculated using data that had been weighted according to the plan described above. Estimates for any variable of interest were determined by summing the poststratified weights for all data records in question.

Variance estimation

Each hospital in the DAWN sample was selected through a random process, which theoretically could have been repeated many times, resulting in many hypothetical samples. "Sampling variance," or the margin of error, refers to the extent to which these samples vary. Two measures of this variability are the standard error (SE) and relative standard error (RSE), which is defined as the SE of the estimate divided by the estimate itself. The precision of an estimate is inversely related to the sampling variance, as measured by the RSE. The greater the RSE value, the lower the precision.

⁷ Information provided by the Louisiana Hospital Association and available at numerous websites maintained by individual hospitals, news organizations, and State and Federal agencies was invaluable in conducting this assessment. We are grateful for their assistance.

For example, if there are 10,000 estimated visits involving a given drug, and this estimate has an SE of 500 visits, then the RSE value is 5%:

$$\text{RSE} = \text{SE/Estimate}$$

$$\text{RSE} = 500/10,000$$

$$\text{RSE} = 0.05, \text{ or } 5\%.$$

In this publication, “confidence intervals” (CIs) are included in many of the tables and are often cited in the text along with the estimates. The 95% CI is calculated as:

$$\text{CI} = \text{Estimate} \pm (1.96 \times \text{RSE} \times \text{Estimate})$$

where 1.96 comes from the table of normal distribution z-values. Ninety-five percent of the normal distribution lies within 1.96 standard deviations of the mean.

Applying the formula to the example above, the 95% CI would be:

$$10,000 \pm 1.96 \times 0.05 \times 10,000 = 10,000 \pm 980.0$$

$$\text{Lower limit: } 10,000 - 980 = 9,020$$

$$\text{Upper limit: } 10,000 + 980 = 10,980$$

$$95\% \text{ Confidence interval (CI): } 9,020 \text{ to } 10,980.$$

If repeated samples were drawn from the same population of hospitals, using the same sampling and data collection procedures, the confidence intervals from the repeated samples would contain the true value 95% of the time.

Variance estimates reported in this publication were determined using Taylor Series Linearization. Variance estimates were calculated using SUDAAN® software.

Standardized rates

Standardized measures are needed to make valid comparisons of estimates across age and gender categories. For age in particular, the size of the underlying population differs considerably across age groups; for example, the number of individuals aged 18 to 20 in the United States is much lower than the number of individuals aged 35 to 44. All other factors being the same, a higher estimate of ED visits would be expected to occur naturally for the group that is larger in the population.

To take the size of the underlying population into account, rates of ED visits per 100,000 population were calculated using population data from the U.S. Bureau of the Census.⁸

⁸ Population counts from U.S. Census 2000 Summary File 1 (SF-1) (see <http://www.census.gov/Press-Release/www/2001/sumfile1.html>). Population estimates for 2005, as of July 2006, from U.S. Census Bureau County Population Dataset NC-EST2005-ALLDATA (see <http://www.census.gov/popest/national/asrh/NC-EST2005/NC-EST2005-03.csv>).

For each age and gender category, the estimate for a category was divided by the population for that category, which was then divided by 100,000. For example, consider an estimate of 1,000 visits for an age group of 1,000,000 persons, and an estimate of 1,000 visits for an age group of 500,000 persons. The rates would be calculated as:

$$\begin{aligned} 1,000/(1,000,000/100,000) &= 1,000/10 \\ &= 100 \text{ visits per } 100,000 \text{ population} \end{aligned}$$

$$\begin{aligned} 1,000/(500,000/100,000) &= 1,000/5 \\ &= 200 \text{ visits per } 100,000 \text{ population.} \end{aligned}$$

Population estimates used to generate rates for this publication are provided in Appendix E.

Standardized rates were not calculated for race and ethnicity subgroups, because the race/ethnicity categories available to DAWN are much less detailed and contain considerably more missing data than the race and ethnicity categories in the Census data. Appendix F describes the race and ethnicity data reported for DAWN.

Two-year trends (changes from 2004 to 2005)

Given that 2005 provides the first results that will be compared with corresponding statistics from a prior year, these comparisons figure prominently in the published results. Differences in rates are presented in the form of percentage differences, which are calculated as the 2005 estimate minus the 2004 estimate divided by the 2004 estimate. The result is presented as a percentage and is included if it is statistically significant. Tests for differences between two years consider the variance of each year's estimate and the covariance between the two. Thus, hospitals that appear in both samples and provide data in both years contribute to the covariance and thus decrease the overall sampling variance beyond the combined contribution of the two samples. The variance estimation process used to establish significance takes into account this overlap between the two annual samples.

Publication criteria

DAWN can produce estimates for thousands of patient characteristics, visit characteristics, and drugs. However, some of these estimates are too imprecise or too small to be reliable. In these situations, the estimate was replaced by three dots (...) in the published table. Estimates were suppressed (i.e., not published) according to the following rules:

- The RSE of the estimate was greater than 50%.

When the RSE is greater than 50%, the lower bound of the 95% confidence interval approaches or includes the value zero. A confidence interval that includes zero means that the estimate is not statistically different from zero at this precision level.

- The estimated quantity was less than 30.

Estimates this small constitute rare events, which are based on a small number of cases and have precision levels that are difficult to quantify. In many instances, such rare events have variances so large that the estimate would be suppressed because of its RSE alone. Rare events that meet RSE criteria for publication are nonetheless based on very little data and are deemed too unreliable for publication.

There are some estimates with an RSE equal to zero. This occurs when the number of ED visits being estimated is small and all the hospitals contributing to that estimate were selected with certainty, that is, their sampling probability is unity. Strictly speaking, there is no sampling error in such situations and the RSE is equal to zero. These results occur almost exclusively in situations with small numbers of ED visits, where the absence of any sampled hospital data is due to nonresponse and the small number of hospitals contributing to the estimates. In these situations, the necessary data are not available to approximate sampling errors.

APPENDIX E

POPULATION DATA

Table E1

Population by age and gender: 2005¹

Gender and age	Total U.S.	Males	Females
Total	296,410,404	145,999,746	150,410,658
0-5 years	24,211,671	12,381,683	11,829,988
6-11 years	23,767,612	12,160,248	11,607,364
12-17 years	25,490,701	13,059,495	12,431,206
18-20 years	12,450,315	6,400,184	6,050,131
21-24 years	16,856,810	8,702,127	8,154,683
25-29 years	20,065,702	10,268,169	9,797,533
30-34 years	20,077,210	10,153,091	9,924,119
35-44 years	43,862,464	21,940,039	21,922,425
45-54 years	42,482,265	20,895,355	21,586,910
55-65 years	30,355,541	14,626,718	15,728,823
65 years and older	36,790,113	15,412,637	21,377,476

¹ Population estimates for 2005, as of July 2006, from U.S. Census Bureau County Population Dataset NC-EST2005-ALLDATA.csv (see <http://www.census.gov/popest/national/asrh/NC-EST2005/NC-EST2005-03.csv>).

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).

APPENDIX F

RACE AND ETHNICITY IN DAWN

In October 1997, the Office of Management and Budget (OMB) issued a revised standard protocol for race and ethnicity categories used in Federal data collection systems.¹ The new protocol permitted separate reporting of race and Hispanic ethnicity, and it incorporated the ability to capture more than one race for an individual, a few modifications in nomenclature (e.g., “black” was changed to “black or African American”), division of certain categories (“Asian or Pacific Islander” was split into two categories, “Asian” and “Native Hawaiian or Other Pacific Islander”), and elimination of the “other” category. For data collections such as DAWN, where self-identification of the individual is not feasible (no patient is interviewed for DAWN), the OMB protocol also permitted a combined format, whereby race and Hispanic ethnicity would be recorded in a single data item, which could still record multiple entries for race and/or Hispanic ethnicity. The single data item for race and ethnicity is shown in the DAWN ED case form that has been used since 2003 (Appendix C, Figure C1).

Despite the increased detail allowed by the new categories and the provision for multiple entries, the actual race/ethnicity data extracted from source records and submitted to DAWN is quite limited. This is because the source documents (i.e., the ED medical records from which DAWN data are abstracted) rarely contain such detailed information on race/ethnicity of patients.

For reference, estimates of drug-related ED visits by race/ethnicity are presented in Table F1. This analysis, which is based on the most detailed coding of race/ethnicity in DAWN case reports, reveals that estimates for the following categories are too small to be meaningful:

- Multiple (i.e., two or more) races/ethnicities (i.e., two or more races/ethnicities were documented in the source record for the same individual),
- Hispanic or Latino ethnicity with any specific race indicated,
- American Indian or Alaska Native,
- Asian, and
- Native Hawaiian or Other Pacific Islander.

Therefore, in the tables of estimates in this and other DAWN publications we have retained a more limited set of categories: white, black, and Hispanic. A fourth category, called “Race/ethnicity not tabulated above (NTA),” is used to tabulate those categories that are too small to report independently.² All cases reported to DAWN as Hispanic or Latino ethnicity are tabulated as Hispanic race/ethnicity, regardless of race.

This lack of detailed race and ethnicity data in DAWN case reports also prevents us from generating rates per 100,000 population for race and ethnicity categories. Data from the 2000 decennial Census were collected and are being tabulated according to the revised race and ethnicity protocol and are therefore incompatible with DAWN estimates.

¹ See Office of Management and Budget, Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity, 62 *Fed. Reg.* 58,782 (October 30, 1997).

² One exception is that, if two races are reported and the second is reported as unknown, the episode is coded for the known race.

Table F1**Drug-related ED visits, by detailed race/ethnicity: 2005**

Race/ethnicity	Estimated ED visits ^{1,2}
Total drug-related ED visits	2,655,612
One race/ethnicity	
White	1,572,916
Black/African American	448,031
Hispanic/Latino	250,495
Asian	5,202
American Indian/Alaska Native	16,216
Native Hawaiian/Other Pacific Islander	1,830
Race unknown	350,232
Two races/ethnicities	
White + Black/African American	940
White + Hispanic/Latino	8,912
White + Asian	33
White + American Indian/Alaska Native	230
Black/African American + Hispanic/Latino	373
Black/African American + Asian	...
Black/African American + American Indian/Alaska Native	...
Hispanic/Latino + Asian	...
Hispanic/Latino + American Indian/Alaska Native	171
Asian + American Indian/Alaska Native	...
Three races/ethnicities	
White + Black/African American + Hispanic/Latino	...
White + Hispanic/Latino + Asian	...
White + Asian + Native Hawaiian/Other Pacific Islander	...

¹ These are estimates of ED visits based on a representative sample of non-Federal, short-stay hospitals with 24-hour EDs in the United States.

² Three dots (...) indicate that an estimate with an RSE greater than 50% or an estimate less than 30 has been suppressed.

SOURCE: Office of Applied Studies, SAMHSA, Drug Abuse Warning Network, 2005 (04/2006 update).